

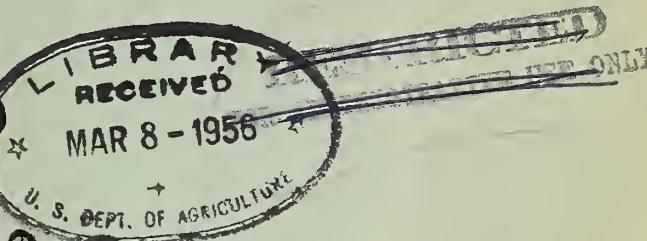
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WOOD RIVER PILOT DISTRICT IDAHO

Including parts of
LINCOLN, GOODING, and CAMAS COUNTIES



A COORDINATED LAND & WATER CONSERVATION PROGRAM



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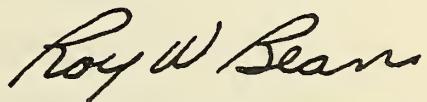
Mr. Mont A. Johnson, Chairman
Wood River Soil Conservation District
Shoshone, Idaho

Dear Mr. Johnson:

The Task Force Committee, Wood River Pilot District, hereby transmits five copies of "A REPORT OF COOPERATING ORGANIZATIONS IN DEVELOPING A COORDINATED LAND AND WATER CONSERVATION PROGRAM FOR THE WOOD RIVER SOIL CONSERVATION DISTRICT" for your review and consideration in preparing a conservation and operations program for the District.

This report inventories the District's resources as accurately as time and facilities of cooperating organization would permit, outlines major conservation needs, and presents a number of recommendations which it is hoped may prove helpful to you in developing a coordinated program for the conservation of the District's resources.

Very truly yours,



Roy Bean, Chairman,
Task Force Committee

Tentative

January 29, 1954

WOOD RIVER PILOT DISTRICT

Including parts of Lincoln, Gooding and Camas Counties

IDAHO

A Report of Cooperating Organization in Developing
A Coordinated Land and Water Conservation Program
for the

WOOD RIVER PILOT DISTRICT

Prepared by a Committee Representing:

Wood River Soil Conservation District
Bureau of Land Management
Forest Service
Extension Service
Soil Conservation Service
Idaho Department of Fish and Game

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Foreword

The information and recommendations presented in this report are based upon an inventory of the agricultural, water and other land resources of the Wood River Pilot District. This information has been collected and assembled through surveys conducted by various county, state and federal agencies, and through the combined knowledge, experience, observation and expressed judgment of farmers, engineers, agricultural workers and others who have participated in this project in one way or another. Published reports of the Wood River Soil Conservation District, State Reclamation Engineer, Canal Companies, U. S. Census of Agriculture, Extension Service, Federal Agencies and other sources have been freely drawn upon in developing this report.

This report has been prepared in compliance with the Board of Supervisors' request for an inventory of the agricultural, water and other resources of the Wood River Soil Conservation District. This information is submitted to the Board for its review and consideration in recommending and initiating a coordinated long-range management and operations program to affect the fullest development of the District's resources consistent with conservation of these assets.

It is recognized that the Wood River Pilot District is only an integral part of a larger geographic area. The economy of the District, therefore, must be fitted into the economy of the area. This effectively can be done only when the District's resources, and how best to use them, are fully understood and appraised. It is hoped this report will provide the District the information necessary to the planning and carrying out of a coordinated resource management program for the District and the area of which it is a functional part.

This report represents the cooperative efforts of the Bureau of Land Management, the Soil Conservation Service, U. S. Forest Service, Idaho Fish and Game Department, Lincoln County Extension Service, State Lands Commission, Wood River Soil Conservation District and the Public Lands Committee, Idaho Association of Soil Conservation Districts.

4. Soil Conservation Service
5. Extension Service
6. State Land Department
7. Idaho Department of Fish and Game
8. Lincoln County Commissioners
9. Public Lands Committee, Idaho

B. Advisory Committee

1. Fish and Wildlife Service
2. Production and Marketing Administration
3. Farmers Home Administration
4. Bureau of Entomology and Plant Quarantine
5. State Department of Agriculture
6. State Highway Board
7. State Reclamation Engineer
8. Lincoln County Pomona Grange
9. Lincoln County Farmers Union
10. Lincoln County Farm Bureau
11. Idaho Wool Grower's Association
12. Idaho Cattlemen's Association
13. Big Wood Canal Company
14. Wood River Grazing District Board No. 5
15. Lincoln County Cattle Association

III. CHARACTERISTICS OF THE WOOD RIVER PILOT DISTRICT

A. Location and Size of the District

The Wood River Pilot District is located in the south central part of the Big Wood River Basin. The District is an integral part of the larger geographic province and includes an area of approximately 1,271 square miles (813,210 acres) of land, roughly an area 45 by 27 miles in extent. It comprises the whole of Lincoln County, 1,203 square miles (769,920 acres), 30 square miles (18,970 acres) in Gooding County and 38 square miles (24,320 acres) in Camas County. The Wood River Pilot District includes the entire Wood River Soil Conservation District together with an adjoining area of range lands lying north and west of the District in Gooding and Camas Counties (Land Status map).

Within the Wood River Pilot District there are 133,070 acres of privately owned lands, 639,480 acres of public lands administered by the Bureau of Land Management, and 40,660 acres of State owned lands. On a percentage basis these acreages amount to 16, 79 and 5 percent respectively for the three ownership classes. Of the total area 54,430 acres or 7 percent is classified as cropland, 89 percent as range, and 4 percent lava fields and waste. Of the cropland approximately

52,000 acres are irrigated cropland and pasture and 2,500 acres in non-irrigated or dry-farmed cropland.

The District is transected by the Big Wood River and Little Wood River, both of which head in the high Sawtooth Mountains to the north. The Big Wood River flows approximately 25 miles through the District and the Little Wood River about 45 miles. It is along these river valleys that the cropland agriculture, rural communities and towns of the District have developed.

B. History of Settlement

The Wood River Pilot District represents an area relatively young in agriculture and community development. This country, however, isn't new. Trappers visited the area as early as 1824, and by 1865 miners had traversed the area in search of minerals.

In 1864, what is now known as Lincoln County was included in the newly created Alturas County, Territory of Washington. In 1889, the area became part of Logan County, Territory of Idaho, and on March 5, 1895, it became part of the newly created Blaine County. But this wasn't to last. On March 18, 1895, Lincoln County was created out of Blaine County and the county seat established at Shoshone. By later referendum and legislative action Gooding and Minidoka Counties were created out of Lincoln County in 1913, and Jerome County in 1919.

Cattle were brought into the area by several operators in the late 1870's and early '80's. Feed was abundant everywhere; cattle were grazed on the range year-round, and the cattle business thrived. The first band of sheep was brought in during the early 80's by Frank R. Gooding. Soon there were thousands. Before the coming of the railroad in 1882-'83 stock were trailed out for sale, some to nearby mining towns and some, it is recorded, were trailed as far as Omaha. S. E. Todd shipped the first trainload of sheep out of this area in 1886.

The severe winter of 1888-'89 caused heavy losses to stockmen and wrought marked changes in range operations. The "notorious" blizzard of March, 1889, followed by sleet and temperatures of 40° below zero, practically wiped out a number of operators. One rancher lost 1,000 head of cattle, and sheep losses ranged from 1,000 to 8,500 among different bands. From this time on, winter feeding became the common practice. Winter feeding led to irrigation farming.

In April, 1877, N. R. Woodworth, Gooding, constructed a dam in the Little Wood River to divert water onto his land. Dan and John Hunter, Shoshone, followed in 1882, and between 1883-1887 several other small diversions were made to irrigate small tracts along the Big Wood and Little Wood Rivers. The irrigation developments made prior to 1900 were mainly small private enterprises. The total irrigated land in the entire Big Wood River Basin in 1900 was about 40,200 acres, of which only a relatively small amount was within the District.

The "Irrigation Projects" developed after the turn of the century. The Magic Dam was constructed by the Idaho Irrigation Co. in 1909. The Richfield, Dietrich, North Shoshone, North Gooding, and South Gooding tracts were developed with storage water from the Magic Reservoir. These tracts comprise 59,340 acres of which 33,500 acres are within the District.

The Magic Reservoir proved somewhat inadequate for the satisfactory development of the above tracts. In 1931 the Bureau of Reclamation constructed the Milner-Gooding Canal and brought water some 70 miles from the Snake River to supplement irrigation needs on 32,000 acres of land in the above tracts and develop 17,000 acres of new reclamation. Approximately 12,000 acres of new land within the District were put into production.

C. Population

The 1950 census data shows the Wood River Pilot District has a population of 4,310* inhabitants, 1,245** dwelling units, 468** farms, 54 retail stores, and 3 manufacturing establishments. The total population included 4,270 whites, and 40 persons of other races. Males numbered 2,267 and females 2,043. Of the 1,614 persons classified in the labor force, 1,364 are males and 250 females. Strong movements of transient and seasonal laborers are uncommon in the District. This lack of seasonal labor somewhat restricts certain types of agriculture, particularly sugar beet production.

The population is located in the towns and irrigated sections of the District, there being no established residences in the range areas. Population of towns

* Includes an estimate of 54 residents in the North Shoshone tract, Gooding County.

** Includes 15 farm dwellings and farm units in the North Shoshone tract, Gooding County.

within the District is as follows for 1950:
Dietrich 160; Shoshone 1,420; Richfield 429.

D. Climate

Climate of the District is typical of the climate of the Snake River Plains province. The range in mean annual and daily temperatures is wide, precipitation and humidity are relatively low, the evaporation rates are high, and there is a high percentage of days of sunshine. The temperature conditions of the lower valley and Snake River Plain comprising most of the District, vary locally with elevation and topography. In the higher elevation winters are cold, summers warm, and frost free season restricted. At lower elevations winters are more moderate and growing season longer. Snow commonly blankets the District during winter months, and lies to a depth of 2 to 4 feet or more in the higher elevations north of Shoshone and the upper Thorn Creek area.

The climate in general is favorable for the production of hay, grain, beans, pasture, seed crops and potatoes. The growing season is somewhat short for maximum yields of beets and corn and late frosts make fruit growing uncertain.

The climate of Richfield (elevation 4300 feet) is typical of the higher plateau and plains section of the District. Here the mean annual temperature is 45° F.; summer and winter temperature extremes range from -40° F. to 105° F. The frost-free period is 100 days. The average date of the last killing frost in the spring is June 5, the first killing frost in the fall, September 13. A comparison of climatological factors for Richfield and Shoshone are shown below:

Item	Richfield	Shoshone
Elevation	4306 Ft.	3968 Ft.
Annual Precipitation	9.54"	10.01"
April - September	3.53"	3.46"
October - March	6.01"	6.65"
Growing Season	100 days	118 days
Last killing frost in spring	June 5	May 25
First killing frost in fall	Sept. 13	Sept. 20
Temperatures - Mean Annual	45°	42°
January (Average)	19.7°	23.0°
July (Average)	70.0°	71.9°
Maximum	105.0°	106.0°
Minimum	-40.0°	-36.0°

E. Topography, Soils and Range Condition

Elevations range from about 3800 feet along the Big Wood River at the west boundary of the District to upwards of 5,500 feet in the hill section of the upper Thorn Creek. Much of the District is characterized by extensive rolling lava fields dating geologically from recent to very old. The more recent flows cover the east third of the District, the area extending south and west from the Craters of the Moon.

Three generic types of soils are found in the District: residual soils largely developed in place by weathering, alluvial soils transported and deposited by streams, and loessial or wind formed soils. The residual soils are the most mature. Wind formed soils are distributed widely. These soils cover about 80 percent of the area, and occur as a mantle of varying depth over the unbroken lava flows extending southward from the mountains and foothills. Depth varies from a few inches to as much as 15 feet or more. Residual soils occur in the foothills of the northeast part of the District, and alluvial soils are distributed unevenly along the stream courses. Unstable light textured soils occur in small widely scattered areas mainly south of the Union Pacific Railroad.

The cultivated soils in general are of wind-blown origin, although residual and alluvial soils are farmed to some extent. Suitability of soils for cultivation is limited primarily by depth and slope; not by generic type.

Approximately 109,160 acres in the District are suitable for cultivation based on soils alone (Land Use Capabilities Map). Of this total, 52,660 acres are scattered in small tracts through the range areas of the District, a considerable acreage of which is now coming under cultivation through "Desert Entry" applications. Based on Land Use Capabilities -- an index of the suitability of the land for agricultural uses -- it is found that 8,300 acres (1%) of the area is first choice agricultural land; 37,970 acres (5%) is second choice; 43,190 acres (5%) is third choice; and 19,730 acres (2%) is fourth choice, comprising in total 13% of the lands of the District, Table 1.

There are limited acreages of Class I and II soils scattered throughout the Public Lands. These areas, however, are generally only a few acres in extent and

are too small to designate separately in the extensive surveys used in mapping the public lands.

TABLE 1. LAND CAPABILITY CLASSES BY OWNERSHIP, WOOD RIVER PILOT DISTRICT

Capability Class	Privately Owned			Public Range**	Total Acres	Percent By Classes
	Cropland	Range	Misc.*			
Suitable for Cultivation						
I	6410	1610	280	--	8300	1
II	27360	9830	780	--	37970	5
III	15200	12840	640	14510	43190	5
IV	5530	10420	330	3450	19730	2
Unsuitable for Cultivation						
V	5	40	--	--	45	--
VI	540	14890	260	177460	193150	24
VII	230	8270	40	410480	419020	52
VIII	5	6150	30	53780	59965	7
Unclassified*	--	--	11380	20460	31840	4
TOTAL	55280	64050	13740	680140	813210	100

* Includes farmsteads, roads, railroad-rights-of-way, canals, waste, etc.

** Includes 40660 acres (about 6% of Public lands) of State owned lands interspersed with lands administered by Bureau of Land Management.

Range lands comprise approximately 724,000 acres, or 89 percent of the total area of the District, while waste and miscellaneous include nearly 32,000 acres or 4 percent of the area. Pioneer stockmen record the fact that original range was largely perennial grassland or grassland-sage type. Changes in plant cover since pioneer times reflect the effect of grazing, fire and other treatment. The lesser amount of perennial grass, greater abundance of sagebrush and rabbit-brush, and the pronounced invasion of cheatgrass and "weeds" mark varying degrees of deterioration from the original range condition. If for purposes of comparison it is considered that the "native" range reflected the highest type of plant development the soils and climate would support the relative condition of the present range lands can then be determined. The term "Excellent Condition" is now ascribed to this top condition by rangemen, and degree of deterioration from this condition is designated by the comparative terms "Good", "Fair" and "Poor". On this basis, the range lands of the District are classified as follows:

<u>Range Condition</u>			<u>Acres</u>	<u>Percent</u>
Excellent (100-76% of Potential Production)			None	
Good (75-51% "	"	"	28,900	4
Fair (50-26% "	"	"	213,440	29
Poor (25- 0% "	"	"	481,660	67

F. Present Land Use

The average size of farm unit is approximately 240 acres, with an average value of land and building of \$17,300 per unit. Nearly 1/3 of the farms of the District are operated under lease or rental basis. Based on the acreage of irrigated lands, the farms of the District are distributed as follows: 1 to 49 acres, 19 percent; 50 to 99 acres, 41 percent; 100 to 199 acres, 34 percent; and over 200 acres 6 percent. Eighty-one percent of the farms have 50 acres or more of irrigated lands, and 55 percent have 70 acres or more. Farms of less than 50 acres are considered submarginal farming units. Improvements in farm machinery and equipment, a diminishing labor supply and other economic factors have fostered a trend toward farms becoming larger, there being 35 more farms in the size class 100 to 199 acres in 1949 than in 1944.

The livestock business is the leading agricultural enterprise of the District. Nearly 53 percent of the better than 3.6 million dollars of farm products sold in 1950 was from livestock. This ratio holds very closely even though prices fluctuate widely from year to year. In general, the livestock business is based on range livestock operations. About 80 to 85 percent of the sheep and cattle are grazed on the private and public ranges through the spring, summer and fall months. Cattle are fed at the farm or ranch headquarters from about December 1 to April 30. Some sheep bands commonly graze the public ranges into early winter before going into the home feedlots. Some bands using the public range in spring and fall are wintered outside the District. Livestock numbers vary widely from year to year with sheep and cattle numbers tending to fluctuate inversely (Table 2). Dairy cattle amount approximately to 25 percent of the total cattle.

In addition to the lands already under Desert Entry applications, there are some 18,000 acres of Public range land classified as Class III and IV soils suitable for farming. As power facilities expand,

wells are drilled and roads make these lands accessible, they will in all probability come under cultivation. This creates an ever changing problem as to the use of the adjoining range lands, and might possibly make considerable changes in the route of travel for numerous sheep operations passing through the District. The continuing withdrawals of Public lands make evident the fact that considerable changes in the present land use will be made, and also that the relationship between farm operation and range operation will change considerably as additional lands come under cultivation.

TABLE 2. LIVESTOCK ON FARMS AND LIVESTOCK SOLD FOR THE YEARS 1944 and 1949 WOOD RIVER PILOT DISTRICT*

Item	1944	1949
All cattle and calves on farms	14,300	13,200
Cows and heifers 2 years old and over	7,000	5,600
Milk cows	3,700	3,125
Cattle and calves sold alive	4,000	5,800
Hogs and pigs 4 months old and over	6,200	3,100
Sows and gilts kept for farrowing	740	470
Hogs and pigs sold alive	10,800	5,200
Sheep and lambs on farms	45,200	53,000
Sheep and lambs sold alive	35,200	26,400
Chickens 4 months old and over	29,100	17,600

* U. S. Census of Agriculture for Lincoln County, Idaho, 1950, adjusted for farms located within the District in Gooding County.

Of the 54,430 acres of cultivated cropland in the District, approximately 30 percent is in cereal grains, 30 percent in hay, 20 percent in irrigated pasture, and 15 percent in row crops and 5 percent in new lands coming into production on which cropping history is not established (Table 3).

Approximate acre yields for the major crops are as follows: Corn (for silage) 11 tons; wheat 36 bu.; feed grains 17 cwt.; alfalfa hay 3 tons; potatoes 144 cwt.; beans 13 cwt.; and beets 11 tons. Average yields of irrigated pasture are approximately 4 animal unit months of grazing per acre. Under present use, 7 to 8 acres of range lands are required to provide one animal unit month of grazing and 40 to 50 acres for a six months' grazing season.

TABLE 3. ACREAGES OF PRINCIPAL CROPS GROWN AND IN OTHER LAND USES BY OWNERSHIPS -- WOOD RIVER PILOT DISTRICT*

Ownership & Land Use	Acres	Percent of Land Use Class	Percent of Total Area
I. PRIVATE		<u>Cropland</u>	
Corn (Silage)	220	(0.3)	
Wheat	11,440	21	
Feed grains	5,050	9	
Hay	16,380	30	
Seed crops	2,410	4	
Potatoes	2,170	4	
Beans	3,000	6	
Beets	240	(0.4)	
Irrigated pasture	10,610	20	
Orchard, gardens, etc.	200	(0.3)	
Newly developed lands	2,710	5	
Sub Total	54,430	100	7
		<u>Range and Miscellaneous</u>	
Range	64,050	81	
Woodlots	850	1	
Farmsteads	1,500	2	
Townsites, railroads, etc.	12,240	16	
Sub Total	78,640	100	9
TOTAL PRIVATE	133,070		16
II. PUBLIC & STATE		<u>Range and Miscellaneous</u>	
Bureau of Land Management	639,480	94	79
State	40,660	6	5
TOTAL PUBLIC & STATE	680,140	100	84
III. GRAND TOTAL	813,210		100

* U. S. Census of Agriculture for Lincoln County, Idaho, 1950, adjusted for farms located within the District in Gooding County.

From 40 to 50 percent of the cultivated cropland is in cash crops each year. In addition to crops grown primarily for cash sale, such as beans, potatoes, beets and seed crops, some 84 percent of the wheat and 29 percent of the feed grains are sold as cash crops. Also, it is variously estimated by stockmen and farmers that from 25 to 50 percent of the hay

is sold off the farms on which it is grown. About half of the hay sold is shipped out of the District.

G. Water Supply and Irrigation Systems

Irrigation water for the District is from two sources: (1) Big Wood River Basin and (2) Snake River. Approximately 330,000 acre feet of water is delivered annually to the farms of the District through the Big Wood Canal Co. system, which includes the Milner-Gooding Canal after it enters Lincoln County. This water from the Snake River (American Falls Reservoir) is delivered into the Big Wood Canal system through the Milner-Gooding Canal, completed in 1931. Water supply is adequate for the 53,110 acres served by the Big Wood Canal Co. under the various tracts within the District. Private canal systems serve about 2,320 acres. All of the water rights are decreed except 850 c.f.s. of licensed water from the Snake River. It is expected this water will soon be decreed.

The distribution system of the Big Wood Canal Co. includes some 40 canals and main laterals within the District, with a total length of about 425 miles. Duty of water at the river diversion is about 6.0 acre feet; at the farm headgate, 4.7 acre feet. Distribution losses run about 17 percent for the Big Wood Canal system and 23 percent for the Milner-Gooding Canal.

There is considerable loss of irrigation water through farm laterals and ditches and a further loss in the low efficiency obtained in the application of irrigation water.

The natural stream flow decrees are augmented by storage rights. Total storage in the 11 reservoirs in the Big Wood River Basin amounts to about 250,000 acre feet, and that in the American Falls Reservoir to 400,000 acre feet.

Recent "Desert Entry" filings, mainly in the southeast corner of the District, total approximately 21,210 acres. These lands, if farmed, will have to be developed by pumping, for most part on an individual farm unit basis. Ground water surveys (U.S.G.S. Report, Ground Water In Minidoka County 1948) indicate an adequate subterranean water supply. Depth to ground water source ranges from 160 to 350 feet. Water cost estimates run \$19 and \$27 per acre per year for gravity and sprinkler irrigation respectively. These costs are based on current operating costs plus depreciating pump equipment and land development in 10 years, and well in 30 years. Because of smaller

size, costs for developing individual farm units run somewhat higher than costs under the Bureau of Reclamation projects in Minidoka County.

H. Forest Resources

1. Watershed Relationships and Conditions

The water used for irrigation comes from the high watersheds on forest lands outside the District. These watershed lands are located primarily in two widely separated areas: One, the headwater tributaries of the Big Wood River Basin immediately to the north of the District, and the other the headquarters of the Snake River as far removed as the Teton mountains and Yellowstone Park in Wyoming. Because the Snake River watershed is so far removed from the District, and the amount of water from this source used by the District is but a minor part of the total Snake River flow, this discussion of watershed conditions is limited to the Big Wood River Basin, of which the District is an integral part.

The Big Wood River Basin comprises an area of about 3,000 square miles. Elevations range from 2,700 feet at the mouth of Big Wood River to better than 10,000 feet on the higher peaks of the Sawtooth Range. Annual precipitation in general increases with altitude with 30 inches or more being recorded in some localities, while a large portion of the Big Wood River Basin watershed receives 25 inches or more of precipitation (Watershed Map).

About 70 percent of the annual precipitation comes as snow, and spring snow melt results in high stream flow. A high degree of storage has been developed for the Big Wood River Basin, there being about 250,000 acre-feet of storage provided in the 11 active reservoirs. Magic Reservoir, with a capacity of 191,500 acre-feet, is the largest reservoir in the entire Basin. A relatively small proportion of the water yield of the Little Wood River drainage is now stored and additional storage is needed for complete utilization.

Since earliest days of settlement, people have looked upon land mainly as sites for homes and as a resource for the production of useful crops, forage, fiber, wildlife and timber. Locally, forest lands have been more regarded for their available timber and grazing resources than for their water resources. That these mountain lands can be managed for the sustained production of useful water is a relatively new concept, although the

national forests were established some 60 years ago primarily for watershed protection. Investigations have shown that land-use and watershed management can increase or decrease usable water yields, increase or decrease runoff rates and step-up or hold-down the sediment load of streams.

A large segment of the Basin's watersheds is in satisfactory condition. This segment includes those lands used principally for timber production, recreation, wildlife, and limited rocky areas unsuited for the grazing of livestock. The watersheds within the National Forests receive adequate fire protection. However, certain watershed lands mainly in private ownership outside the National Forests have been subjected to repeated burnings. There is a growing need for public recognition that the burning of watershed lands is a dangerous practice.

Some 153,000 acres of lands on the Wood River watershed in the Sawtooth National Forest suitable and used for grazing can be improved and better watershed condition established. Some of these lands are still deteriorating and eroding, although in almost all cases, the present rate of deterioration and erosion has been reduced over that prevalent in the past or stopped. The 153,000 acres of watershed lands suitable for grazing are principally in fair and poor condition, with 2% in good condition, 39% in fair, and 59% in poor.

Water shortages and floods have occurred in the Wood River Basin. Loads of sediment in the stream-beds from eroding lands are increasing the seriousness of water problems by fouling streams, shoaling channels and shrinking the storage space in reservoirs. This situation is particularly serious in the vicinity of Carey, Idaho, on Little Wood River which flows through the Pilot District.

2. Forest Grazing Relationships and Conditions

Some 23,000 sheep from dependent ranches in the District are moved north each year to summer grazing allotments on the Sawtooth, Challis and Boise National Forests. An additional 22,000 sheep from dependent ranches outside the District enter the spring-fall ranges of the District each spring and then travel north to the forests for summer grazing. Only a few cattle are moved from District ranges onto forest lands for summer grazing. There are four more or less clearly

defined sheep movements which form a pattern of grazing in the district and movement to the forest lands to the north (Livestock Movement Map).

- a. The longest trailing is done by bands coming off the Bruneau Desert about April 15th, crossing the Snake River at Bliss and remaining in the District until about June 1. On leaving the District, these sheep enter the lower end of the Ketchum-Stanley driveway, which they take to late spring and early summer grazing lands in the foothills and the high mountains. These bands may take alternate routes and go either northeast from Bliss to Timmerman Hill area or east from Bliss to Shoshone and thence north or further east to the Big Desert skirting Richfield and to the Timmerman Hill area. The length of the trail from the Bruneau Desert to the high watersheds of Big Wood River can exceed 100 miles when the most circuitous routes are taken.
- b. Bands which are shed lambed in the vicinity of Jerome and Shoshone between February 1 and March 15 are turned out about April 1 and travel either directly north to the Timmerman area or travel east to the Big Desert skirting Richfield and thence to Timmerman area about June 1 and enter the Ketchum-Stanley sheep trail to drive to the high watersheds.
- c. A number of bands, shed lambed in the Rupert and Burley area in early February and March, enter the Big Desert about April and move across to the Timmerman area or across the Wildhorse-Star Lake area to the Little Wood watershed above Carey. They reach the foothills for early summer grazing about June 1 and move on to higher ranges as summer advances.
- d. A small yet consistent use of the District is made by sheep run by small operators in the vicinity of Carey. These sheep enter the Wildhorse and Laidlaw Park areas about April 1, remaining there until late May when they are returned to their home places, or moved onto foothill ranges on the Little Wood River watershed near Carey.

Fall use in the District by sheep begins about October 15, when the bands trail down from the high watershed or come from bucking pastures in the vicinity of Hailey, Bellevue and Carey. Fall use may continue until December 31, but the dry condition

of the desert in many years often forces the sheep onto the farms for feed and water at an earlier date.

The condition of forest lands used for summer grazing by sheep from dependent ranches in the District can be improved. Of the 119,600 acres used for grazing at the present time, some 35,400 acres are temporarily or permanently unsuited for grazing use because of steep slopes, unstable soils or accelerated erosion. Experience has shown that special management practices will neither restore the cover and stabilize the soil within reasonable period of time nor maintain satisfactory conditions. Approximately 84,200 acres of forest lands suitable for summer grazing are used by sheep from dependent ranches located in the District. These lands, principally in fair and poor condition, can be further improved by grazing management. Of the total area, 10,900 acres (12%) are in good condition, 18,800 acres (22%) are in fair condition, and 54,500 acres (66%) are in poor condition.

I. Wildlife and Recreational Resources

Wildlife is an important asset to the District. Wildlife of one kind or another makes use of every acre of land in the District (Game Management Map). The pheasant is the most abundant and also the most popular upland game bird in the area. It has become well established throughout the irrigated sections of the District. Other game birds that provide hunting and recreational use include Hungarian partridge, California valley quail, sage grouse, mourning dove and waterfowl.

Big game species are limited to deer and antelope. Deer are mainly winter migrants, although there are a few summer residents. Deer provide limited hunting. A resident herd of about 50 antelope ranges throughout the vast area east of the Shoshone-Carey Highway, but the herd has not built up to the point to allow hunting.

The principal fur bearers are the muskrat and the raccoon. The muskrat is a constant pest in the irrigation ditches and canals. Both the muskrat and raccoon are increasing in numbers, and are not trapped or otherwise harvested to the extent desirable for the full utilization of this resource.

Fish are found in all main streams and in many of the canals. Rainbow trout are found in the Little

Wood River above Richfield, while smallmouth bass, perch and trash fish are the principal fish in the river below this point. Small mouth bass and perch could, as these recent introductions become better known, furnish more fishing. Carp and other trash fish could also be more fully utilized in off-season periods, thereby providing additional recreation and promoting conditions more favorable to game fish.

Maximum production and harvest of wildlife resources in the District is somewhat restricted by a number of factors critical to wildlife management. Among these are: (1) Limited food and cover for pheasants, quail and partridge during severe winters. (2) Competition for winter food by starlings, a species for which effective control measures have not yet been developed. (3) Adverse effect on sage grouse habitat by fire and plowing up of sagebrush lands. (4) The posting of lands which makes difficult the maximum desirable harvest of pheasants. Winter census counts show an excess of cock pheasants in relation to hens. (5) Destruction of bitterbrush on winter deer ranges by burning. (6) Loss of fish through canals and the drying up of stream channels through diverting the entire stream flow for irrigation.

The recreational and economic values of the wildlife resources of the District scarcely can accurately be appraised. It amounts to thousands of dollars each year. Pheasants furnish 18 to 21 days of hunting each year, and waterfowl 60 to 70 days. In a one-day season in 1951 the sage grouse drew 1106 hunters afield. Thousands of miles are traveled by sportsmen each year over the highways of the District to reach such famous fishing spots as Magic Reservoir and Silver Creek and other streams outside the District.

J. Management and Control of Predators, Rodents and Insects

Predators present no particular problem in the District. Coyotes and bobcat numbers have been kept down to a point where losses from these animals are very infrequent.

Rodent control occasionally becomes necessary. Jack rabbit populations at times build up to pest numbers. Considerable losses to growing crops, particularly alfalfa, occur in infested areas. In the winter of 1950-51, for example, a combination of deep snow and a large rabbit population made control measures necessary to prevent excessive

hay losses. Rock chucks are a problem each year in the spring and early summer. The lava rock formations make it a practical impossibility to completely eradicate these pests, although poisoning, shooting and other control measures do help keep down numbers. Field mice frequently cause considerable crop damage. Poisoned grain has proved successful in their control. Mice damage also is a serious hazard on new range seedings and their control is sometimes necessary to insure successful establishment of range seedings.

A number of insects cause economic losses to crops and livestock. Foremost among crop pests is alfalfa weevil. These insects can effectively be controlled with air and ground sprays and dusts following approved methods. Grasshoppers are capable of causing great losses when the population builds up. In the summer of 1953 a population build-up made it necessary to spray 40,000 acres of range lands in the District to protect adjacent cropland. The grasshoppers existed mainly on mustard, although some new range seedings were eaten down. Crop damage was confined to a small amount of alfalfa and potatoes. Conditions favorable to grasshoppers one year can cause serious trouble the next year.

High populations of beet leafhoppers, lygus bugs, and flea beetles produce a spring generation on the mustard plants on range lands from which they move and infest crops on irrigated lands. The beet leafhopper transmits the virus of curly top, the most important virus disease affecting agricultural crops such as beans, beets, tomatoes, melons, and many ornamental flowering plants. Lygus bugs affect alfalfa and greatly limit alfalfa seed production by preventing seed from forming. The beet webworm, Says plant bug, and other insects breed large populations on Russian thistle and then move from this weed into the cultivated areas where they attack several crops. The economic loss caused by these insects can be greatly reduced if the weedy range plants are replaced by perennial grasses. Other insects of somewhat less importance include wire worm, corn ear worm, seed corn maggot, aphid and red spiders.

Aside from the beet leafhoppers, lygus bugs, flea beetles, grasshoppers and Mormon crickets, most of the insects affecting agricultural crops breed up within the cultivated areas. Chemical control for such insects is generally effective if treatment

is applied at the right time and the right way. The old adage "do it right or not at all" applies strongly to insect control.

Insects of economic importance to livestock include grubs and lice on cattle, ticks on sheep, and lice and mange mites on hogs. Flies are more or less of a problem among all classes of livestock. Farmers are becoming aware of the necessity of controlling these pests to maintain profitable operations. Considerable losses, however, still occur as a result of damage from insects.

Tick control on sheep assumes even greater importance when tularemia is present. An outbreak of tularemia occurred among range sheep in the District in 1952, causing severe losses to a number of operators.

One factor affecting the control of both crop and livestock insects is the absence of commercial spray operators in the District. Lincoln county weed department makes use of its spray equipment during off-season for livestock spraying but cannot do both livestock and weed spraying during the summer months when both insect and weed control measures should be carried out.

K. Noxious and Poisonous Weeds

Weeds are a serious agricultural problem confronting the District. A 1951 survey shows the following acreages of weeds on the cultivated land in the District: Canada thistle 6,220; Bindweed 2,124; Quack grass 500; Russian knapweed 307; Whitetop 114; Ground Cherry 20; Total 9,285 acres.

Canada thistle is by far the most serious of the noxious weeds present, with the Richfield area particularly badly infested with this weed. Wild morning glory, quack grass, and knapweed appear in all parts of the County. Ground cherry is found chiefly near Richfield, and whitetop both at Richfield and in the North Shoshone area. The Dietrich area is the least infested of the three main agricultural sections of the District.

No figures are available for noxious weeds on range lands. It is known, however, that Canada thistle occurs in widely scattered areas. Knapweed and whitetop are occasionally found also. Of greater probable importance on the range are plants poisonous to livestock, although few losses have occurred. Death camas occurs throughout the range area, as

does low larkspur, loco, lupine, and in wet spots, water hemlock. It is quite possible that halogeton has invaded the District, although the closest known plants are approximately four miles east of the District line in Minidoka County.

A definite noxious weed problem exists on road, railroad, and canal rights-of-way. Of the nearly 100 miles of railroad rights-of-way within the District, approximately 20 miles contain noxious weeds. This would amount to about five miles of solid infestation.

Weed control work on railroad land is carried out by Lincoln County through an agreement with the railroad. Spot treatment with 2,4-D is the method used. Present cooperative agreements limit expenditures to \$195 for weed control along railroad rights-of-way. This amount is sufficient to give good control on all infested areas.

Over 425 miles of canals exist in the District with some probable weed infestation on 350 miles. The Big Wood Canal Company operates one spray rig full time at Richfield, and keeps another spray outfit in the District about two-thirds of the time.

Contracts are made on a yearly basis between the State Highway Board and Lincoln County for weed control work on State Highways. The Highway Board appropriates \$300 for treating noxious weeds which at present is adequate.

In 1952 Lincoln County contracted all work done on county roads in the three highway districts in the county. The maximum allowable expenditure for each district was \$400, which was adequate to cover work done. The miles of road and estimated amount of solid infestation are as follows:

	Shoshone	Dietrich	Richfield	Total
Miles of road	151	123	119	393
Amount of solid infestation	6	2	20	28

L. Livestock Program

There were approximately 13,200 cattle and 53,000 sheep in the District in 1950 (Table 2). Their importance to the District's agricultural economy can be seen from the following figures:

Value of all farm products sold	\$3,664,000
Field crops	1,728,000
Livestock and livestock products	1,934,000
Sheep, lambs and wool	626,000
Cattle and calves sold alive	580,000
Dairy products sold	359,000

It is noted that approximately 17 percent of the agricultural income comes from the sale of sheep and wool, and nearly 16 percent from the sale of cattle. Dairy products add almost another 10 percent.

Range sheep operators prefer crossbred white-face ewes. The common practice is to use black-face rams, ordinarily Suffolks, on these ewes to produce a fast-gaining market lamb. Some range outfits raise their own replacements, but most operators buy them from breeders in other localities producing high quality white-faced lambs.

The quality of range sheep is considered to be above average. Much experimental and improvement work is done at the Western Sheep Breeding Laboratory, Dubois, Idaho, and some breeding stock becomes available to operators in this area from time to time. The University of Idaho Extension Service further provides information and other assistance in promoting improvement work. The Idaho Woolgrowers Association is also active in promoting improvement in both range and farm flocks.

Farm flock sheep are average in quality. A wide variety of breeds and mixtures are kept, which creates certain problems in marketing of wool and lambs. Some farmers obtain aged range ewes and are able to keep them for one or two seasons profitably.

The District's beef cattle are mostly Hereford, with some Angus and Shorthorns. The most common beef set-up is a commercial herd, with calves sold as weaners. Registered bulls are used on grade cows. There are only a few purebred breeders in the District. The quality of both grade and purebred cattle is about average.

Some livestock improvement work is being promoted by the Lincoln County Cattlemen's Association. It has sponsored educational-type bull grading tours for the past two years and has also

encouraged stockmen to put more bulls on the range. Both programs have yielded favorable results.

The Thorn Creek Association, with members in both Gooding and Lincoln Counties, grades the bulls of all its members. It has been able to improve the quality and increase the number of bulls going on the range.

Most of the farms in the District have dairy cows. The number of cows totaled 2,940 in 1950. The predominating breed is Holstein, with lesser numbers of Guernseys, Milking Shorthorns, Jerseys, and animals of mixed breeding. There are a very few Brown Swiss, Ayrshire, and Red Polled animals. Registered herds are not numerous, although many dairy animals are high grade, particularly in the Holstein breed. Registered bulls are used by the better dairymen, but unfortunately many use grade animals of questionable quality. Artificial insemination service is available throughout the District from artificial insemination stations at Jerome and Richfield. Dairymen in increasing numbers are making use of this service.

The average dairy production for the District is not known. Average production for Idaho is estimated at 6,200 pounds of 4% milk, which amounts to 248 pounds of butterfat per cow. It is probable that cows in this locality run close to the state average.

Average production of cows in Unit Number 2 of the Gooding-Lincoln-Jerome DHIA is 364 pounds fat and 10.893 pounds milk for 1952. All DHIA cows in the state averaged 367 pounds fat last year. Only five herds in the District are on test in the DHIA.

Dairymen in the District have the choice of three main outlets for milk or cream. These outlets include the Nelson-Ricks Cheese Plant at Richfield, the Sego Milk Plant at Buhl, and the Jerome Coop. Creamery at Jerome. All three companies maintain truck routes in the District.

IV. CONSERVATION PROBLEMS

A. Conservation Accomplishments

The common objective of the various agencies and organizations working with the soil, water and other resources of the Wood River Pilot District

has been to promote a better agriculture and a sounder economy for the area. Much has been accomplished. The water resources of the area have been developed, and canals and laterals to serve the bulk of the agricultural lands of the District have been constructed.

Since 1928 the Extension Service has promoted improved crop varieties, better cropping systems, and fertilizer practices and better livestock breeding, feeding and management. Improved marketing methods and facilities have been established.

Since its organization in 1943 the Wood River Soil Conservation District has given assistance in the application of conservation practices on the land. Detailed conservation surveys showing land use capability classes have been completed on 157,000 acres of agricultural and adjoining range lands. Conservation farm plans have been developed and are in use by 290 district cooperators. Improved irrigation systems have been developed to serve 13,300 acres; 16,000 acres of land have been leveled for irrigation, and improved pasture management established on 9,100 acres.

Grazing management practices have been instituted on 680,000 acres of Public and State range lands. Conservation surveys giving capability classifications have been completed on practically all the range lands; 9,840 acres of burned over or deteriorated range lands have been reseeded, 56 stock ponds constructed, 73 miles of truck trails and firebreaks made, and an organization for fire detection and suppression perfected. Improved grazing and forestry practices have been initiated on high watershed areas to safeguard the water resources of the area.

B. Conservation Needs

The conservation needs of the District do not resolve themselves into sharply defined entities. Range reseeding, for example, is only one phase of range management. Fire protection, stock water, and livestock management to affect proper season and intensity of use must be provided if maximum returns from the newly re-established forage resource is to be realized.

The major conservation needs of the District are outlined below:

1. Cropland

a. Conservation Improvements

<u>Improvements</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Cost</u>
Land leveling	13,000 ac.	\$ 40	\$ 520,000
Irrigation Systems (old)	15,000 ac.	2	30,000
Irrigation Systems (new)	9,700 ac.	10	97,000
Sprinkler Irrigation	7,800 ac.	60	468,000
Irrigation Wells	70 ea.	12,000	840,000
Irrigation Reservoirs	24 ea.	700	16,800
Tree Planting	200 ac.	100	20,000
<u>TOTAL</u>			\$1,991,800

b. New Land Development

Conservation improvements on approximately 17,500 acres of new land developments are included in the above tabulation. Of the above acreage, 3,350 acres are additional land which can be put under cultivation and irrigation on the already established farms, and 14,150 acres are agricultural lands coming under new development through recent Desert Entry filings. The 3,350 acres on already established farms can be developed at a cost of approximately \$50 an acre, making a total cost of \$167,500 for clearing, leveling and the extension of present irrigation systems. The cost of development for new farm units will run about \$116 per acre, or a total of \$1,638,300. The entire cost of developing both classes of new lands would amount to \$1,805,800.

These new lands when developed will raise the acreage of cultivated land in the District to 71,930 acres - an increase of 32 percent.

c. Benefits

Concurrent with the establishment of practices listed above, the application of such management practices as soil building crop rotations, utilization of crop residues, use of green manure crops, fertilizer practices, improved pasture management and improved irrigation methods and practices

will need be carried out to conserve the District's cropland resources and insure high crop yields (Table 4).

Once the new lands are fully developed and the necessary conservation measures and better farming practices applied District-wide, it can be expected that the production of feed resources will be approximately doubled, and cash crops increased by a similar or even greater amount. At current prices, the value of the gross increase of one year's production can be expected to equal the entire cost of developing new lands and applying needed conservation improvements on all the crop-lands of the District. Benefits would accrue also from land improvements, as well as increased crop production. The value of expected increased annual production is tabulated as follows for principal farm crops:

<u>Crop</u>	<u>Annual Increase</u>	<u>Value Per Unit</u>	<u>Total Annual</u>
Hay	51,946 tons	\$12.00	\$ 623,352
Spring grain	163,160 bu.	1.85	302,846
Feed grains	59,556 cwt.	2.50	148,890
Potatoes	487,520 cwt.	1.25	609,400
Beets	47,760 tons	13.00	620,880
Beans	12,200 cwt.	6.70	82,740
Pasture	62,560 aum	3.00	187,680
Total annual value of increased production			\$2,575,788
Total cost of land improvements			1,991,880
Cost of developing new lands			1,805,800
Appraised value of new lands			2,625,000
Net increase in value of new lands			\$ 819,200

2. Range Lands

a. Range Conservation Needs

The range resource of the District can be greatly expanded through the application of better management practices, together with the necessary range improvements. The two phases -- management and improvement -- will of necessity have to be developed concurrently if range restoration and increased production is to be affected.

TABLE 4. PRESENT AND EXPECTED PRODUCTION OF PRINCIPAL FARM CROPS
RESULTING FROM DEVELOPMENT OF NEW LANDS AND THE APPLICATION OF
CONSERVATION IMPROVEMENTS AND PRACTICES

Crop and yield	Units	Acres		Average Yield *		Production *		
		Present	Expected	Present	Expected	Present	Expected	% Inc.
Hay	tons	16,380	26,500	3.3	4.0	54,054	106,000	96
Spring wheat	bu.	11,440	9,500	36	50	411,840	575,000	40
Oats	bu.	2,730	3,000	47	75	128,310	225,000	86
Barley	bu.	2,320	2,600	43	60	99,770	157,000	57
Potatoes	cwt.	2,170	4,000	144	200	312,480	800,000	156
Beans	cwt.	3,000	3,200	13	16	39,000	51,200	31
Beets	tons	240	2,800	11	18	2,640	50,400	2144
Pasture	aums	10,610	14,000	4	7.5	42,440	105,000	147
Misc.Crops etc.		5,540	6,330					
Total		54,430	71,930					

* Yield and production figures are expressed in units commonly used for these crops as shown in column 1.

TABLE 5. RANGE LAND IMPROVEMENTS AND ESTIMATED COSTS BY OWNERSHIPS

Improvements & Unit	Private	Amount			Unit Cost	Cost		
		Public & State	Total	Private		Private	Public & State	Total
Range Reseeding (ac)	20,000	73,100	93,100	\$ 8	\$160,000	584,800	744,800	
Brush Control (ac)	9,600	32,000	41,600	4	38,400	128,000	166,400	
Wells (no.)		10	10	4,000		40,000	40,000	
Spring Develop. (no.)	1	1	2	300	300	300	600	
Stock Ponds * (no.)	150		150	75	11,250			11,250
Stock Reservoirs (no.)		50	50	500		25,000	25,000	
Fences (Miles)	45	57	102	650	29,250	37,050	66,300	
Truck Roads and Trails (Miles)		150		250		37,500	37,500	
Cattle Guards (no.)		20		400		8,000	8,000	
Total					\$239,200	860,650	1,099,850	

* Small ponds filled from the canals to provide stock water for small areas of private range and cropland fields after harvest.

The range improvements on forest lands within the Big Wood River Basin (used in part by livestock from dependent ranches within the District) are not included in the improvement needs and cost estimates (Table 5). Since these forest lands are managed primarily to safeguard water resource values, grazing, therefore, is a regularly used and dependable by-product of watershed lands. The management necessary to safeguard the water resources will also safeguard the forage resources.

b. Benefits

On an acreage basis the private ranges offer the greatest opportunity for increased forage production because of land that can be reseeded. An increase of 49 percent in forage production on private lands might be expected even after 17,500 acres are withdrawn for agricultural development by the combination of better management, reseeding and brush control, Table 6. Individual units might be increased by as much as 4 or 5 times. Forage production on Public Lands can be expected to be increased an average of 80 percent or 95,943 animal unit months of grazing, with a total increase for all range lands of 75 percent, or 101,162 animal unit months.

An increase of 75 percent in forage production does not necessarily reflect an opportunity for an increase in range livestock numbers by an equal amount. Such an increase in forage production should, however, help stabilize the range livestock industry and result in greater gains and an increase in amount of livestock products sold. This increase in range forage production, coupled with the increased production possible in hay, feed grains and pasture on irrigated lands, indicates a greatly expanded livestock economy is possible.

At the going rate of two cents per sheep day or ten cents per cow day paid locally for pasture rental, this increased forage resource has a value of \$303,486 annually. Figured in terms of livestock products -- 20 pounds of salable gains* per animal unit months of grazing -- this additional grazing resource might be expected to yield 2,023,240 pounds of meat

*The equivalent of an additional 20 pounds gain per aum is allowed for maintenance of breeding stock.

which at 16¢ per pound would have a value of \$323,718 annually. Either method reflects comparable values for this grazing resource.

3. Water Resources

a. Watershed Conservation Needs (Outside of District but contributes to District resources)

Improvements	Units	Unit Cost	Cost
Gully Stabilization	52 miles	\$1100	\$ 57,200
Drainage Controls, Roads & Tr.	38 miles	400	15,200
Stream Channel Improvement	6 miles	400	2,400
Stream Bank Planting	30 miles	400	12,000
Stream Bank Stabilization	3 miles	600	1,800
Stock Driveway Improvement	87 miles	425	36,975
Fences	86 miles	1200	103,200
Sheet erosion control	1400 acres	18	25,200
Reseeding Watershed Lands	14000 acres	14	196,000
Water Developments	7 each	450	3,150
Shipping Corrals	2 each	600	1,200
Total			\$454,325
District's share - 31 percent*			\$140,840

The objective of a watershed restoration program for the Big Wood River Basin should be to insure:

1. Ample water yields.
2. Desirable distribution of seasonal flows.
3. Usable water free from sediment or materials that will damage water distribution facilities.
4. High quality water suitable for use contemplated.
5. Water supplies available at a reasonable cost.

The relative weight of these objectives may differ on each headwater tributary of the Big Wood River Basin. Whether these objectives can be satisfied by any one kind of treatment or management is difficult to determine. And obviously an effective watershed management program must include all needed conservation measures. Decisions

* Approximately 117,000 acres irrigated by waters from the Big Wood River Basin, of which about 36,000 acres are within the District.

TABLE 6. PRESENT RANGE FORAGE PRODUCTION BY RANGE CONDITION
MANAGEMENT PRACTICES AND OWNERSHIP

Ownership & Practice	PRESENT ACRES AND PRODUCTION							
	Good Condition		Fair Condition		Poor Condition		Total	
	Acres	A.U.M.	Acres	A.U.M.	Acres	A.U.M.	Acres	A.U.M.
Private: Management Range Reseeding	1,700	680	21,790 840	4,842 187	38,900	4,862	62,390 840	10,384 187
Total	1,700	680	22,630	5,029	38,900	4,862	63,230	10,571
Public: B.L.M.- Management Range Reseeding	24,080 1,500	9,632 600	177,520 1,540	39,450 342	408,860 6,800	51,108 850	610,460 9,840	100,190 1,792
Total	25,580	10,232	179,060	39,792	415,660	51,958	620,300	101,982
State: Management	1,620	648	11,750	2,611	27,100	3,388	40,470	6,647
U. S. Forest Service: Management	10,900	4,360	18,800	4,178	54,500	6,812	84,200	15,350
Total by Practices: Management Range Reseeding	38,300 1,500	15,320 600	229,800 2,380	51,081 529	529,360 6,800	66,170 850	797,460 9,840	132,571 1,979
Grand Total	39,800	15,920	232,240	51,610	536,160	67,020	808,200	134,550

Ownership & Practice	EXPECTED ACREAGES AND PRODUCTION						
	Good Condition		Fair Condition		Total		Percent Increase
	Acres	A.U.M.	Acres	A.U.M.	Acres	A.U.M.	
Private: Management Range Reseeding Brush Control	6,480 16,740 8,000	2,592 6,696 3,200	8,810 4,100 1,600	1,958 911 356	15,290 20,840 9,600	4,550 7,607 3,556	
Total	31,220	12,488	14,510	3,225	45,730	15,713	49
Public: B.L.M.- Management Range Reseeding Brush Control	171,600 62,270 24,000	68,640 24,908 9,600	340,860 15,570 6,000	75,749 3,460 1,333	512,460 77,840 30,000	144,389 28,368 10,933	
Total	257,870	103,148	362,430	80,542	620,300	183,690	80
State: Management Range Reseeding Brush Control	11,100 4,100 1,600	4,440 1,640 640	22,270 1,000 400	4,949 222 89	33,370 5,100 2,000	9,389 1,862 729	
Total	16,800	6,720	23,670	5,260	40,470	11,980	80
U. S. Forest Service: Management	31,600	12,640	52,600	11,689	84,200	24,329	58
Total by Practices: Management Range Reseeding Brush Control	220,780 83,110 33,600	88,312 33,244 13,440	424,540 20,670 8,000	94,345 4,593 1,778	645,320 103,780 41,600	182,657 37,837 15,218	
Grand Total	337,490	134,996	453,210	100,716	790,700	235,712	78

* Surveys showed forage production to vary widely with site and range condition. Average values (acres per animal unit month) were used as follows: Good Condition, 2.5 acres; Fair Condition, 4.5 acres; Poor Condition, 8.0 acres.

which must be made by administrating agencies are often of utmost importance to downstream users. Wider public recognition of watershed management as an essential approach to the solution of water problems is needed to assure the adoption of land use practices which will make possible an effective watershed program.

A watershed management program should be based upon the following cardinal principles:

- (1) Soil Stability - Soil stability is dependent upon the amount and character of plant cover, litter and organic material including the kind and activity of organic life in the soil. This points to the necessity of maintaining some kind of effective plant and litter cover upon the entire water source area. Neither satisfactory seasonal distribution nor quality of water flow can be maintained without soil stability. Satisfactory water yields from unstable soils may possibly be obtained temporarily, but sooner or later unstable soil conditions on a watershed adversely affect yield and quality of water. The maintenance of a high organic matter content in the soil and a porous structure are vital to soil stability.
- (2) Percolation Capacity - A high infiltration capacity of the soil is closely associated with stability and, indeed, is often an indicator of it. It is most important that desirable rate of infiltration be maintained, primarily to eliminate or minimize destructive surface runoff from storms of high intensities or long duration or from excessive snow melt. Infiltration capacity is related more closely to the structure of the soil, to its organic content and to the adequacy of the surface plant cover than it is to the topographic characteristics of the area, including length and steepness of slope.
- (3) Water Hold Capacity - Maintenance of the soil's optimum water-holding capacity is essential to achieve a more desirable ratio between sub-surface flow and annual runoff, as well as a more balanced seasonal distribution of sub-surface flow, particularly during dry periods.

b. Forest Grazing Conservation Needs

Watershed lands in poor condition should be reseeded or allowed to revegetate naturally. It may be necessary to supplement seeding with contour furrowing, water spreading or other improvements.

Improved grazing management can correct many of the unsatisfactory conditions on watershed lands and assure the effectiveness of watershed improvements.

Freshly gullied slopes, deeply ripped channels, thinning topsoil and plant cover and sand and gravel bars on the move towards reservoirs and irrigated lands are indicative of unsatisfactory watershed conditions.

The findings of recent watershed and range studies have important management implications for granitic soils on the watershed of the Big Wood River Basin. These studies indicate that ranges with ground cover of plant and litter of less than 70% are in unsatisfactory watershed condition and should be improved.

Light grazing use appears permissible on granitic soils with a 70 to 80% ground cover, but 90% of the soil surface should be left untrampled. Where watershed lands have an 80% to 90% cover, light to moderate grazing use may be allowed, but 80% of the soil surface should be left untrampled. On heavily vegetated watershed lands with a cover of 90% or more, trampling alone apparently is not too serious, but use is limited by other factors, such as the necessity for leaving enough herbage to assure plant vigor, seed production and maintenance of the plant and litter cover.

Observations made on the other soils of the watershed of Big Wood River Basin indicate that a cover of plants and litter approaching closely to 70% is needed to keep the soil in place on steep mountainous slopes. These other soils generally being more stable than granitic soils will withstand heavier trampling damage than that indicated for granitic soils. On these soils, notable examples of range and watershed recovery has been noted under grazing management, which permits light to moderate grazing by either sheep or cattle.

Adjustments in grazing use found necessary on watershed lands should be accomplished by a shift in use from mountainous watershed to the foothills and the more level and rolling plains of the Snake River Valley, where erosion hazards are less pronounced and watershed values low. To permit such transfer, large reseedings on range and irrigated lands suitable for grazing can be undertaken by private, state and federal funds. Surveys indicate that 30% of the private range lands and 10% of the Public range in the Wood River Pilot District are suitable and in need of reseeding.

Good grazing management can minimize erosion and sediment production on watershed lands. Management should provide for (1) delay in grazing until the vegetation and watershed lands are ready for use; (2) the control of the number of stock using the watershed; and (3) removal of the stock when the allowable limits of use have been attained.

c. Distribution System

The Big Wood Canal Company which serves practically the entire District has made a constant effort toward minimizing canal distribution losses. Water losses the last few years have run about 16 to 17 percent in the Big Wood Canal system proper and 22 to 23 percent in the Milner-Gooding canal, which brings water some 70 miles across the lava beds from the Snake River. It is recognized that gradual improvement can continue to be made in reducing water losses by plugging holes and by sealing porous sections as they are located or found to develop. Any further major reduction in distribution system losses can be had only at considerable cost. However, if demands for irrigation water continue to grow high construction costs to affect such a saving might be justified. A saving of 5 percent in the 330,000 acre-feet of water delivered into the canals of the District would be sufficient to irrigate an additional 4,125 acres of land.

d. Irrigation Efficiency

Based on an average of 4.7 acre-feet of water delivered at the farmer's headgate, irrigation efficiency for the District as a whole is found to run about 30 percent. Some farmers attain

a much higher efficiency than this on certain crops and fields. The further application of such practices as land leveling, improvement in farm irrigation systems and improved irrigation methods and water application should result in materially increasing the over-all irrigation efficiency. An increase of 10 percent in the irrigation efficiency would, in effect, amount to the same as developing an additional 33,000 acre-feet of water; a supply sufficient to irrigate an additional 8,250 acres of land.

e. Benefits

One of the major benefits to be realized from watershed improvement and management is that of assuring an adequate supply of water year after year for the lands, industries and other uses already developed within the District. However, any saving in water that can be effected by further improvements in the canals and irrigation systems, and by improved irrigation methods and water application should have monetary values the same as would additional water. A saving of 15 percent in the amount of irrigation water delivered to the District through the lining and sealing of canals and irrigation systems, and by increasing irrigation efficiency, would amount to roughly 49,500 acre-feet of water annually, an amount sufficient to irrigate approximately 12,375 acres of additional land. Water stock alone to this amount would have a value of approximately \$618,750, while land values, above cost of development, would add approximately an equal amount, or a total of \$1,361,250.

4. Livestock Resources

The livestock, cropland and water resources of the District are inseparable. Livestock complements and makes possible the full utilization of the cropland and water resources. It is important, therefore, that the improvement and conservation needs of the livestock enterprise be considered in any appraisal of the conservation needs of the District. A greatly enlarged and stabilized livestock enterprise is needed to fully utilize the feed resource that may be developed by the application of soil and water conservation practices on range and cropland.

Some of the major management and livestock improvement needs of the District are outlined as follows:

- a. Range Sheep - Improvement in breeding, feeding, management and disease control to secure heavier wool clips, larger lamb crops and bigger lambs.
- b. Farm Flocks - Better breeding and management, shorter breeding season, greater uniformity among farm flocks to facilitate better marketing of wool and lamb crops. Use of good pastures to obtain better gains and crowd lambs through to market size and finish at an earlier age. Disease control in sheep lots and pastures, and elimination of stray dogs which take heavy toll from farm flocks.
- c. Range Cattle - Better breeding and management of breeding herd. Shorter breeding season to give shorter calving season and more uniformity in age and size of calves. More bulls, better bulls and better conditioned bulls when turned onto the range. Better feeding both winter and summer.
- d. Dairy Cattle - Better breeding and dairy herd management. Controlled breeding season to have cows calve at desired time of year. More careful selection of replacement stock. Better care of calves to avoid heavy calf losses, through neglect, disease and malnutrition.
- e. Benefits - The sale of livestock products in the District amounted to approximately \$1,934,000 in 1950. This was 53 percent of the gross agricultural income. This relative amount would be materially increased if the hay and feed grains now sold as cash crops were marketed through livestock. This practice also would aid greatly in maintaining soil fertility, increasing crop yields and conserving soil and water resources.

It is reasonable to expect that farm livestock numbers will be increased to approximately the same extent that cultivated cropland is increased, which would mean an increase of 32 percent. Independent of any increase in livestock numbers, however, the operations of successful livestock men who employ the principles of good feeding, management and breeding indicate that livestock income can be increased by the following amounts without increasing livestock numbers:

Possible Increase in Livestock Income

(1) Range sheep	10 percent increase
(2) Farm flocks	20 percent increase
(3) Range cattle	15 percent increase
(4) Dairy cattle	20 percent increase

Average weighted increase in livestock income - 15 percent

Value	\$ 290,100
(5) By increasing livestock numbers additional 32 percent	\$ 711,712
Total expected increase	\$1,001,812

Total increase over 1950 sales of livestock products would amount to approximately 52 percent.

5. Wildlife Resources

a. Conservation Improvements

<u>Improvements</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Amount</u>
Windbreaks for food & cover	250 ac.	\$ 150	\$37,500
Farm fish ponds	40 ea.	400	16,000
Water developments	60 ea.	100	6,000
Winter range revegetation	15 sec.*	1,000	<u>15,000</u>
Total			\$74,500

Since wildlife improvements are associated with conservation improvements for farmsteads, cropland and range only, the additional cost necessary to adapt these projects for wildlife are included here. These projects will be developed cooperatively with individual farmers on privately owned lands, and with the Bureau of Land Management on Public lands, and with the State Land Department on State lands.

b. Wildlife Management Needs

- (1) Deer - The major problem in deer management is the lack of winter range. The deer using winter ranges are mainly winter migrants, the number moving into the District varying

* Small selected sites of choice winter game ranges in 15 sections of land.

considerably with the severity of winter conditions. The number using these ranges appears to be increasing in recent years. In severe winters deer concentrate upon small areas with the resultant over-use of available forage. The principal concentration areas are the Thorn Creek - Preacher Creek - Summit Lake and Tews Ranch Triangle.

During more severe winters deer concentrate in the hills immediately adjacent to the Tews ranch. In such concentration areas the better forage species are severely over-grazed and many of the plants are killed out. Chance fires do great damage to winter deer ranges. Bitterbrush, the choice winter forage of the area, is readily killed by fire, and, unlike many shrubs, bitterbrush does not readily sprout from the roots following burns. It is also difficult to re-establish by reseeding or planting because of the competition by cheatgrass and other plants and over-grazing by livestock and game while the plants are small. Mice also sometimes completely destroy bitterbrush seedlings by digging up and eating the seed.

In the interest of better winter range management, a few select range sites where deer concentrate in winter possibly should be set aside for deer management studies. These sites are not choice livestock ranges, but rather are areas of rough terrain having favorable exposures and capable of supporting vegetation highly preferred by deer. Further study may be required in order to ascertain number of deer that should be harvested to safeguard winter feed supply. A knowledge of seasonal movements may become necessary before proper management of the deer herd can be initiated.

- (2) Antelope - The antelope range is adequate for the resident herd, estimated at about 50 head.
- (3) Upland Game Birds - Improvements in upland game habitat reflects two needs:
 - (a) Habitat improvement for pheasants, quail, and partridge on cropland and farmsteads, and

- (b) improvement in sage grouse habitat on rangelands.

Additional food and cover would therefore appear to be the key to better management. It is held that small windbreaks and field border plantings, from 1/4 to one acre in extent, on each of the 468 farms of the District would greatly benefit pheasants and quail.

Suitable planting stocks are available from State and private sources. The State Fish and Game Department can assist in this program under cooperative agreements with individual farmers and with other State and Federal agencies. It may become necessary to control starlings, which compete with pheasants for winter food, if the full benefit of habitat improvement is to be realized. This may require further investigations as effective control measures for starlings are presently unknown. Improvement in sage grouse habitat will result from improvement in range condition and the construction of wells, stock reservoirs, and the adoption of other conservation practices envisioned in the range improvement program.

- (4) Waterfowl - Waterfowl nesting and habitat areas in the District are somewhat restricted. Grain stubble fields afford excellent feeding areas for ducks during fall migrations and periods of open winters. Ducks provide considerable hunting and recreation during the 60 to 70 day season each year, and any opportunities for improvement of waterfowl habitat should be sponsored by landowners and local sportsmen groups.
- (5) Fish - Farm fish ponds offer great possibilities for further development of this resource. Well managed farm ponds yield from 100 to upwards of 300 pounds of usable fish per acre annually. Such ponds do not require running water, but otherwise must be properly constructed and managed.

The Idaho Fish and Game Department can furnish without cost to farmers the fish best suited to his particular pond. Farmers should take advantage of this service, as

conditions do vary greatly from one farm pond to another, and success of farm fish ponds hinges strongly in stocking with the proper numbers of adapted species.

- (6) Landowner-Sportsmen Relations - Local
sportsmen group can do much to promote better farmer-sportsmen relations. Sportsmen groups could, both in the interest of better farmer-sportsmen relations and game management, well afford to promote and assist land owners with windbreak and field border plantings.

A sincere expression on the part of sportsmen groups to cooperate with farmers in the production and management of fish and game could do much to eliminate the posting and closing of lands to hunting and fishing. Sportsmen must be willing to assume the obligation of good conduct that should go with the privilege of using another's land. The farmer needs to develop the idea that not all sportsmen are irresponsible, careless and unmindful of his property and rights.

c. Benefits

There is no satisfactory way of accurately assigning values to recreation and other wildlife resource yields. The game harvest for the District in 1953 is estimated at 2,500 sage grouse, 10,000 pheasants, 12,000 ducks, 100 geese, and 33 deer. At very conservative prices this amount of meat has a value of \$40,000.

Hunting and fishing have developed into big business. In 1953 there were 3,655 licenses and permits sold in the District, amounting to \$15,558. It is estimated that expenditures* by sportsmen in the District amount to at least \$150,000 annually for such items as licenses, equipment, travel, supplies and other expenses incidental to hunting and fishing. Thus the wildlife resource shows a net balance of \$190,000 annually. Recreational values and income from fish and game can be expected to increase at least 25 percent as means of better management and utilization are developed.

* Adult sportsmen \$125, resident juveniles \$20, and non-District resident sportsmen \$15 annually.

RECOMMENDATIONS

The objective of landowners and all cooperating organizations should be to work toward the fullest practicable development of the soil and water resources of the District. The coordinated development of these resources rests ultimately with the landowners. The Board of Supervisors, Wood River Soil Conservation District, and other cooperating organizations can lend direction and assistance to many of the projects, but the task of getting needed conservation measures established on the land rests finally with the landowners and landusers. Adjustments in land use will in some instances have to be affected before certain practices and improvement programs can be initiated. This will prove particularly true for certain phases of the range program. Protection must be provided for areas set aside for reseeding, brush control and range rehabilitation until the specific practice can successfully be completed and establishment assured. Half-way measures will prove costly and result finally in no real improvement.

This District-wide program for the coordinated development and improvement of the land and water resources must be undertaken with positive objectives. It is easy to argue that "things" cannot be done. Such an attitude will preclude ever accomplishing the goals set forth under "Expected Production". And yet the committee feels that these goals are conservative and sound. The top-half of the farmers in the District are already exceeding these standards of production.

This report is based upon surveys adequate to evaluate the land and water resources and point up the major conservation problems and needs of the District. It is realized more detailed studies and surveys will have to be made before some of the projects can be undertaken. Range users and administrators will need to determine the exact location of wells and water developments, etc. to best serve a given area or allotment. Similarly, range reseeding and brush control sites must be selected to minimize the adjustments in grazing use already established.

A time schedule for carrying out this program should be set up, priorities of work established, and needed technical and financial assistance requested. This sort of a developmental program has some of the aspects of a livestock feeding program -- full feeding generally is the most economical, as so many stockmen can attest. A twenty-year period or less for the completion of the program is recommended. In developing a coordinated action program for resource conservation and establishing priorities for the various projects which must be undertaken, the economic conditions and needs of the Nation, State and District

should carefully be considered. The present reduction requested nation-wide in a number of cultivated crops, for example, may afford an opportunity for establishing better soil building practices and improved pastures, and getting needed improvements on range lands.

Landowners can carry out their individual conservation programs as speedily as their own finances will permit, while the improvement program on Public and State lands may be limited by available personnel and funds with which to carry out the recommended practices. Some financial assistance may be available to individuals through the Agricultural Conservation Program.

The projected conservation improvements on private lands may create heavy demands for technical assistance, especially in engineering, education and conservation planning and application. Without technical assistance, farmers can make expensive mistakes in the development of new lands and the application of such improvements as wells, pumps, irrigation systems, land leveling, cropping systems, fertilizer practices, water application, and livestock and grazing improvement.

It is recommended that improvement work on Public and State lands be carried out cooperatively with range users in-so-far as possible. This can reduce cost, and also get needed practices applied to smaller tracts and on areas not readily accessible to the large equipment used by contractors. This has proved especially true in range reseedings.

The proposed conservation program for cropland and range envisions a much greater use of privately owned irrigated cropland and pasture for livestock production than has previously been used. This will permit better livestock management, make possible faster gains, better finish in market animals, and greater livestock production. Stockmen should find well managed grass-legume pastures or grass-legume hay stands more profitable for livestock production than for cash hay sales. It will also help maintain soil fertility, increase crop yields, and use land more nearly in accordance with its capability. This latter principle should be emphasized -- land cannot be conserved if used beyond its capability.

The possibilities for developing recreational facilities, such as picnic acres, play grounds, and roadside or riverside parks which likely may be created at various locations, particularly along the Little Wood River, were not investigated by this committee. It is recommended that opportunities for such facilities may be studied and findings presented to civic clubs, chambers of commerce and other organizations which might be interested in developing such projects.

VI. SUMMARY

1. The physical resources, present and expected annual production and cost of land development and conservation improvements necessary to the establishment of a fully-developed and coordinated conservation program for the soil and water resources of the Wood River Pilot District are shown in Table 7.
2. The District embraces an area of approximately 1,271 square miles, or 813,210 acres. Of this amount, 133,070 acres are privately-owned, 639,480 acres are public lands administered by the Bureau of Land Management, and 40,660 acres are State lands. 54,430 acres (7%) are classified as cropland, 724,000 (8%) as range, and 34,780 acres (4%) as miscellaneous and waste. Population is listed at 4,310 inhabitants in 1950. Elevation ranges from 3,800 to 5,500 feet. Climate is typical of the Snake River Plains and, in general, is favorable to the production of hay, grain, pasture, seed crops, potatoes and beans. Growing season is from 100 to 120 days.
3. Agricultural development in the District dates to the early 1870's, but the bulk of the irrigated lands came into use after 1900. Soils are principally wind formed over lava, and vary greatly in depth. Approximately 109,160 acres (13%) are classified as suitable for cultivation, and 724,000 acres suitable for range. Based on range condition, 29,000 acres (4%) of range are classified as presently being in GOOD CONDITION; 213,000 acres (29%) in FAIR CONDITION; and 482,000 acres (67%) in POOR CONDITION. Approximately 30% of the cropland is in hay, 30% in cereal grains, 20% in irrigated pasture, 15% in row crops, and 5% miscellaneous.
4. The livestock industry contributes approximately 53% of the total agricultural income of the District, which was reported at \$3,644,000 in 1950. The quality of range sheep is good, while that of farm flocks and of range and dairy cattle is about average. Approximately 80 to 85% of the sheep and cattle are grazed on private or public range lands during spring, summer and fall seasons. Some 23,000 head of sheep from ranches within the District move north each year for summer grazing on forest watershed lands in the headwaters in the Big Wood River Basin and watershed lands in the Salmon and Boise river drainages. Another 22,000 sheep from ranches outside the District also use District ranges in their yearly movements from home feedlots to summer grazing areas on forest and other lands.
5. The irrigation water for the District is from two sources: The Big Wood River Basin and the Snake River

Approximately 330,000 acre-feet are delivered annually through the distribution systems of the Big Wood Canal Co. Canal losses run about 17% in the Big Wood Canal system and 23% in the Milner-Gooding Canal, which brings water a distance of 70 miles across the lava plains from the Snake River.

6. Predator control in the District is a minor problem. A build-up in insect and rodent populations occasionally occurs, and control measures become necessary. Weed control is becoming a serious problem. Approximately 20 miles of railroad rights-of-way and 350 miles of canals and laterals contain noxious weeds, and infestation along highways amounts to 28 miles of solid weed patches.
7. The conservation needs on private lands of the District fall into two categories: (a) constructing and otherwise applying needed conservation improvements and practices on already established farm units, and (b) establishing effective conservation practices on new lands coming under development for irrigation and cropland production.
8. The acreage of cultivated land can be increased from 54,430 acres to 71,930 by developing 3,350 acres of additional land on already established farms and 14,150 acres of new land coming under development out of public lands through recent Desert Entries. The total cost of developing new lands and applying needed conservation improvements, such as land leveling, improvements in irrigation systems, irrigation wells, sprinkler installations, etc., is estimated at \$1,991,800. Off-setting these costs is an estimated increase of approximately double the amount of feed resources and an even greater increase in cash crops. At prices prevailing in recent years, the total increased production, once these lands are fully developed, would have a value of \$2,575,788 annually. Land values would also be increased by approximately \$819,200.
9. The cost of additional conservation improvements on range lands, including reseeding on 93,100 acres, brush control on 41,600 acres, 10 wells, 200 stock ponds and reservoirs, and other miscellaneous improvements, is estimated at \$1,099,850. Present range production amounts to 134,550 animal unit months of grazing. It is estimated that the increased production that could be affected jointly by the above range improvements and better range management (made possible by these installations) would amount to 101,162 animal unit months, an increase of 75 percent. At 2¢ per sheep day, or 10¢ per cow day, rates paid locally for pasture rental, this increased forage production would

TABLE 7. SUMMARY OF RESOURCES, PRESENT AND EXPECTED ANNUAL PRODUCTION
AND CONSERVATION IMPROVEMENT COSTS BY OWNERSHIPS
WOOD RIVER PILOT DISTRICT

Status, Land Use - Production Units	Present Condition		Cost of Improvements	After Program is Established			
	Acres No.	Estimated Production Units		Acres No.	Estimated Production Units	Increase Units	Value of Annual Increase
Cropland							
Hay	Tons	16,380	54,050	26,500	106,000	51,946	623,352
Pasture	A.U.M.	10,610	42,440	14,000	105,000	62,560	187,680
Cereal Grains	Bu.	16,490	639,920	15,100	957,000	317,080	451,736
Row Crops	Dollars	5,410	920,590	10,000	2,599,250	1,678,660	1,313,020
Other Uses		5,540		6,330			
Total		54,430	\$1,991,800	71,930			2,575,788
Range Land							
Private	A.U.M.	63,230	10,571	239,200	45,730	15,713	5,142
B.L.M.	A.U.M.	620,300	101,982	811,850	620,300	183,690	81,708
State	A.U.M.	40,470	6,647	48,800	40,470	11,980	5,333
U.S.F.S.	A.U.M.	84,200	15,350	140,840 *	84,200	24,329	8,979
Total		808,200	134,550	\$1,240,690	790,700	235,712	101,162
Livestock - Private							
Range Livestock			\$1,206,000			\$1,807,014	\$ 601,014
Dairy			359,000			568,656	209,656
Other			369,000			560,142	191,142
Total			\$1,934,000			\$2,935,812	\$1,001,812
Wildlife							
		\$ 190,000	\$ 74,500			\$ 237,500	\$ 47,500
GRAND TOTAL - I		862,630	\$3,306,990	862,630			\$3,928,355

II	After Program is Established			
	Items and Units	Cost of Development	Value of Resource	Increase over Cost of Development
<u>LAND AND WATER</u>				
New lands	17,500 acres	\$1,805,800	\$2,625,000	\$ 819,200
Water Conservation Distribution Systems (5% saving in water losses)	16,500 acre-feet 4,125 acres of land	** \$ 206,250	618,750	412,500
Irrigation Efficiency (10% increased efficiency)	33,000 acre-feet 8,250 acres of land	*** \$ 412,500	\$1,237,500	\$ 825,000
Total	12,375 acres of land	\$ 618,750	1,856,250	\$1,237,500
GRAND TOTAL II	29,875 acres	\$2,424,550	\$4,780,000	\$2,056,700

* Watershed lands used for grazing. Cost of conservation improvements included with water resources in text.

** Covered by canal maintenance cost; no major improvement work planned.

*** Covered by conservation improvements on cropland.

have a value of \$303,486. Based on 20 pounds of gain per animal unit month of grazing, this amount of additional feed would yield 2,023,240 pounds of livestock on the hoof, which at 16¢ per pound amounts to \$323,718 annually.

10. Watershed management should be based on those practices necessary to safeguard the water resource. Management practices which will assure the proper conservation of the water resource will also maintain the forage resource. The conservation improvements needed to safeguard the watershed values of the Big Wood River Basin are estimated at \$140,840. This amounts to \$3.91 per acre for the irrigated land now served by water from this source. Annual water assessments greatly exceed this amount.
11. Improvements in past years indicate additional saving in water distribution losses can economically be brought about by further plugging and sealing of leaks and porous sections in canals and laterals. A higher irrigation efficiency through the application of such practices as land leveling, improvement in irrigation systems, and improved irrigation practices will also effect an additional saving in water. A combined saving of 15 percent might be expected through these efforts. Such a saving would amount to 49,500 acre feet of water, with a stock value alone of \$618,750. The increased value of newly developed land would at least equal this amount, making a total of \$1,237,500.
12. Livestock are an inseparable segment of the District's agriculture, which makes possible the full utilization of the District's soil and water resources. Income from livestock might be expected to be increased by at least 15 percent (without increasing numbers) by the fuller application of the known principles of good feeding, breeding, selection and management.

In the growth of coordinated conservation program, an increase in livestock numbers should parallel cropland development. An increase of 32 percent in numbers might therefore be expected. Cost of an increase of 32 percent in additional breeding stock is estimated at \$662,680, while increased annual production of the enlarged livestock program would total \$1,001,812. Also, a greater proportion of the feed resources -- hay, pasture and feed grains -- might more profitably be marketed through livestock than is currently being done.

13. Wildlife resources may be expanded by improvement in wildlife habitat and closer landowner-sportsmen relations. Additional winter food and cover is a paramount

need, particularly for pheasants, quail and deer. Cost of wildlife improvements is estimated at \$74,500, while the increased income from this resource would amount to \$47,500 annually.

14. The over-all coordinated conservation program envisioned in this study will move through developmental stages to completion only as speedily as the landowners and land-users apply it. Objectives must be positive and in the interest of resource development and wise use -- true conservation. At an estimated total expenditure of \$3,306,990 for the needed resource development and conservation improvements, an annual return of \$3,928,355 might be expected in increased agricultural income. This increase is approximately 107 percent over current agricultural income; or slightly more than twice present income.

APPENDIX

SURVEY METHODS AND PROCEDURES

In assembling the data presented in this report, information from several sources has been drawn upon. The early history was developed by the Women's Auxiliary, Wood River Soil Conservation District. Climatological data was taken from U.S.D.A. Yearbook "Climate and Man", while information on population, livestock numbers, cropland acreages, production yields and other data pertinent to the land was taken from the U. S. Census and U. S. Census of Agriculture for 1950. It was necessary to adjust the data for Lincoln County, Idaho, somewhat to include lands in Gooding and Camas Counties added to Lincoln County to comprise the Wood River Pilot District. The District Program, Wood River Soil Conservation District, and Geological Survey Circular 192 provided information on generic soil types and topography, etc.

The land use capability data and range resource information were derived from a number of sources:

- (a) Land Use Capability - Conservation surveys on private lands have been done during the period 1943 to date by the Soil Conservation Service. These are detailed surveys which give information pertinent to the capability of the land for use. These facts include: soil depth, texture, permeability, underlying material, slope, erosion, degree of wetness, salinity, or alkalinity, nutrient supplying capability, water supplying capacity, overflow and the present land use, i.e., cultivated, or range. On the basis of these facts, land surveyed is classified into capability classes and sub-units within the class. These units are used as a basis for planning conservation needs and practices on privately-owned lands.

Similar surveys in much less detail were made on Public and State lands cooperatively by the Bureau of Land Management and the Soil Conservation Service. These surveys are in sufficient detail to delineate broad soil types and land use capability units, and furnish information on acreages suitable for range reseeding and other range improvement practices.

Land Suitable for Cultivation

Class I - Very good land that can be cultivated safely with ordinary good farming methods. It is nearly level, the soil is over 48" deep, very productive, and easily worked.

Class II - Good land that can be cultivated, but requires limited easily applied protective measures. It is gently

sloping, the soil is 30-48" deep and moderately susceptible to erosion.

Class III - Moderately good land that can be used regularly for crops in a good rotation, but needs intensive conservation treatment. It may be moderately steep, the soil is over 15" deep, may be light, medium or heavy textured, or wet.

Class IV - Fairly good land that is best maintained in perennial vegetation, but can be cultivated occasionally, or in a limited way if handled with great care. It is best suited for hay or pasture and should be cropped only when re-establishing the stand.

Land Suitable for Grazing

Class V - Land very well suited to permanent vegetation, grazing with few or no permanent limitations and not more than slight hazards. The land is nearly level, but certain range management practices are always needed to obtain satisfactory production.

Class VI - Land well suited for grazing, subject to moderate permanent limitations or moderate hazards under grazing use. It is too steep, shallow, stony, dry or otherwise not suited for cultivation.

Class VII - Land fairly well suited for grazing, subject to severe hazards under use. It may be steep, eroded, rough, shallow, stony or dry, but can be used for grazing if handled with care. Has considerable lava outcropping.

Class VIII - Land that is suited for wildlife, recreation or watershed protection. Mainly lava wastes and small sand dune areas.

- (b) Range Surveys - Three types of range surveys were used in determining range forage resources and collecting other basic information on range lands: (1) A range survey made by the Bureau of Land Management on Public and State lands north of the North Shoshone tract and west of the Shoshone-Hailey Highway was made in 1941 by the Square-Foot-Density method. (2) A survey made by the Bureau of Land Management in 1953 included Public and State lands south of the Union Pacific Railroad. This survey was made by the Weight-Estimate Method. (3) Private range lands were surveyed in 1953 by the Soil Conservation Service employing the Range Site-Range Condition Method. (4) Surveys on forest watershed lands outside the District have been made by the U. S. Forest Service by the Range Condition Method. (5) The area east of the Shoshone-Canyon Highway was covered by sample spot surveys and range sites then delineated on aerial photographs by the use of the stereoscope.

While there are slight variations among the different survey methods, each method yields basic information from which the forage resources and range conditions can be evaluated. To unify the information gathered by the various surveys and bring surveys up to date, field checks were made to correlate the various procedures and forage inventories. These data were then used for two primary purposes; namely: determining forage yields, and classifying grazing lands as to condition. From these data the grazing lands of the District were classified into four condition classes: Excellent, Good, Fair and Poor. This classification is briefly described for each condition class as follows:

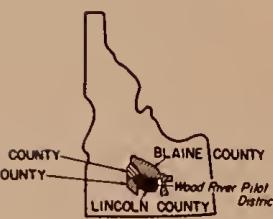
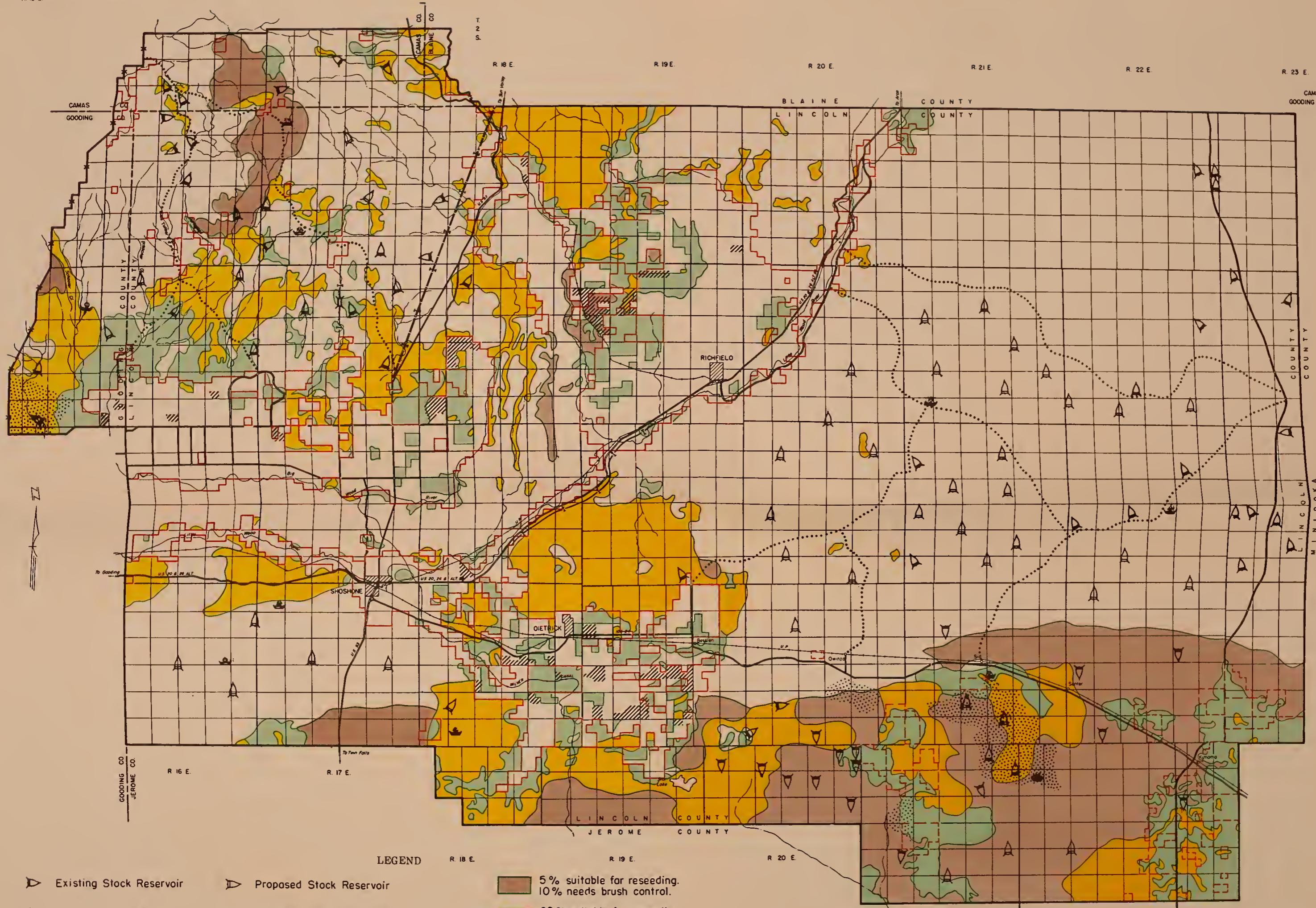
- (1) Excellent Condition Range - Between 76-100% of the vegetative cover is made up of desirable perennial forage plants, litter and plant residue is adequate, present erosion is slight.
- (2) Good Condition Range - Between 51-75% of the vegetative cover is made up of desirable perennial forage plants, litter and plant residue is adequate, present erosion is slight.
- (3) Fair Condition Range - Between 26-50% of the vegetative cover is made up of desirable perennial forage plants, litter and plant residue may be inadequate, erosion is not more than moderate.
- (4) Poor Condition Range - Less than 25% of the vegetative cover is made up of desirable perennial forage plants, plant residue is inadequate and erosion is moderate to severe.

When based on "Range Condition", the various surveys were found to be in close agreement if extensive areas were taken into account. Market variation in forage production was noted in many instances from one ownership to another. This commonly reflected differences in range condition rather than differences in production of various range units in the same condition. Accordingly, average forage production values and surface acre allowances per animal unit month of grazing were used in this report. The average values for the three range conditions are as follows:

<u>Condition Class</u>	<u>Yield Per Acre A.U.M.</u>	<u>Surface Acre Per A.U.M.</u>
Good	0.40	2.5
Fair	0.22	4.5
Poor	0.125	8.0

Water resource data was taken from reports of the Big Wood Canal Company and Geological Survey Circular 192.

Conservation needs of the District were derived from several sources including field write-up sheets (range surveys), management plans and maps, annual reports Wood River Soil Conservation District, County Weed Supervisor, Extension Service, farmers, Livestock Associations, elevator men, and staff members of cooperating organizations.



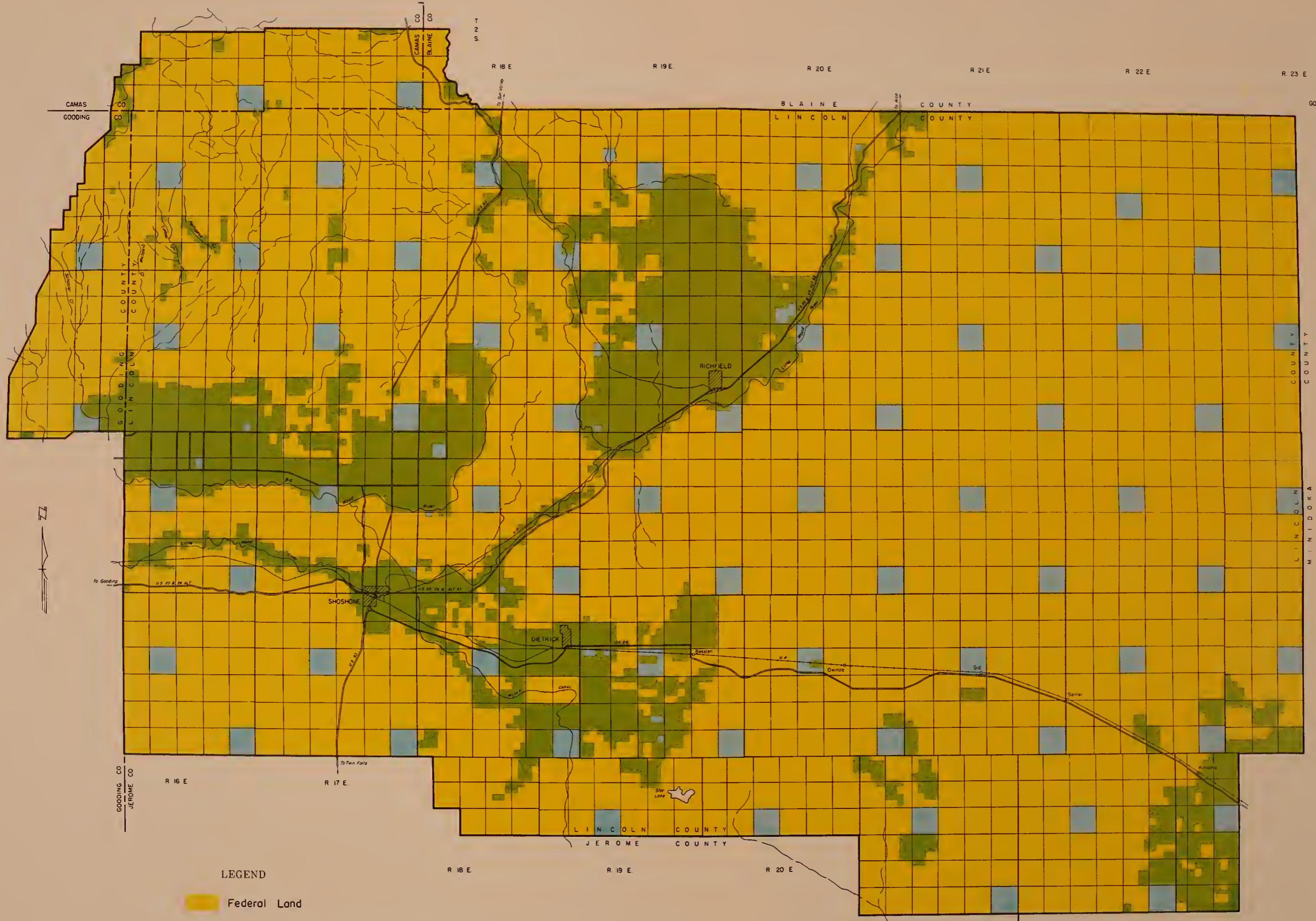
LOCATION MAP

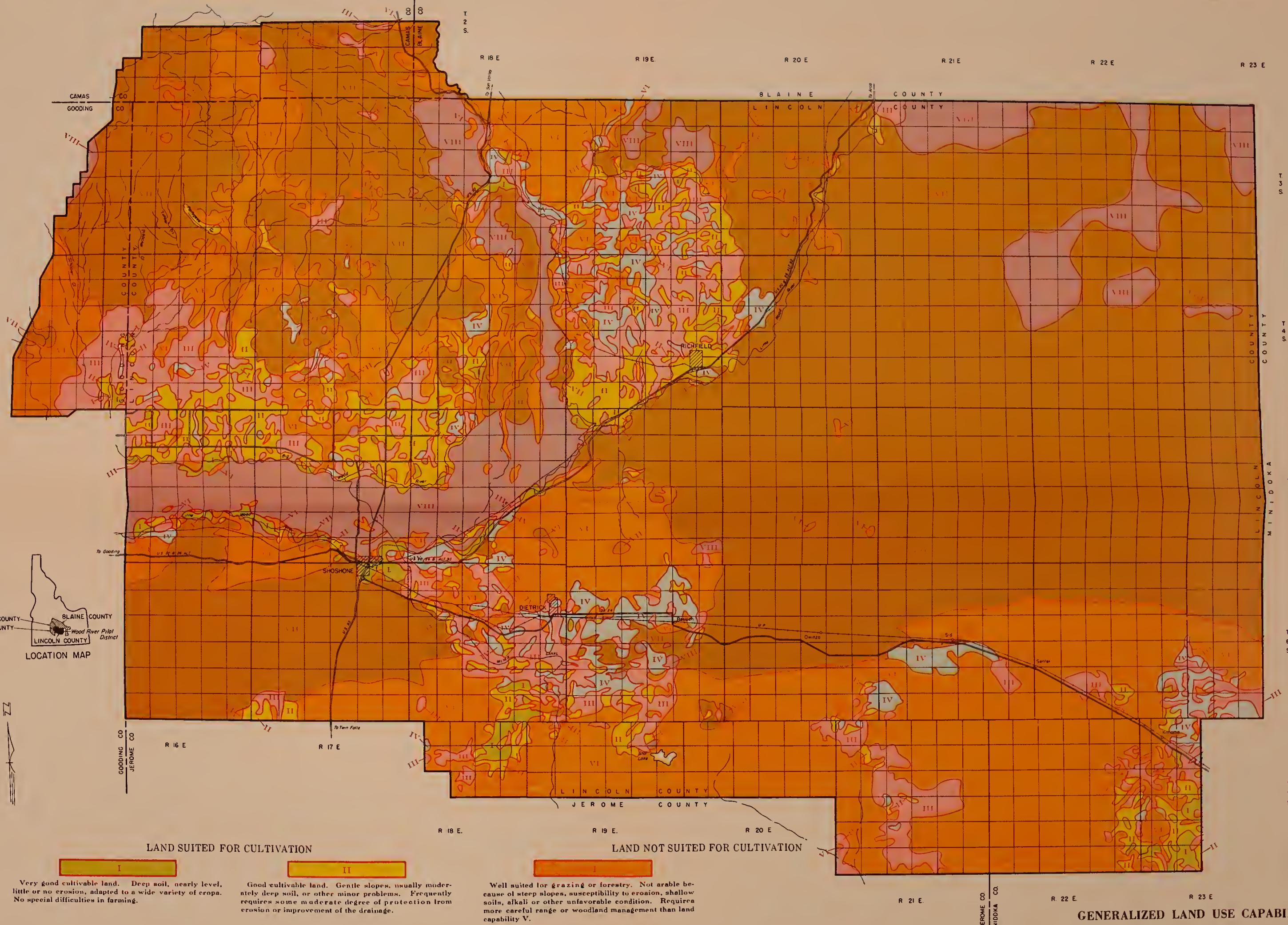
- Existing Stock Reservoir
 Proposed Stock Reservoir
 Spring and Trough
 Proposed Well and Trough
 Truck Trail and Firebreak
 Existing Seeding
 Private Land
 Private Land. Recent Desert Entries

- 5% suitable for reseeding.
10% needs brush control.
 60% suitable for reseeding.
25% needs brush control.
 100% suitable for reseeding.
 Needs brush control (Private Land).

RANGE IMPROVEMENT WOOD RIVER PILOT DISTRICT LINCOLN, BLAINE, CAMAS, & GOODING COUNTIES, IDAHO

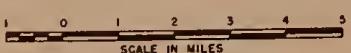
JANUARY 1954





**GENERALIZED LAND USE CAPABILITY
WOOD RIVER PILOT DISTRICT
LINCOLN, BLAINE, CAMAS, & GOODING COUNTIES, IDAHO**

JANUARY 1954



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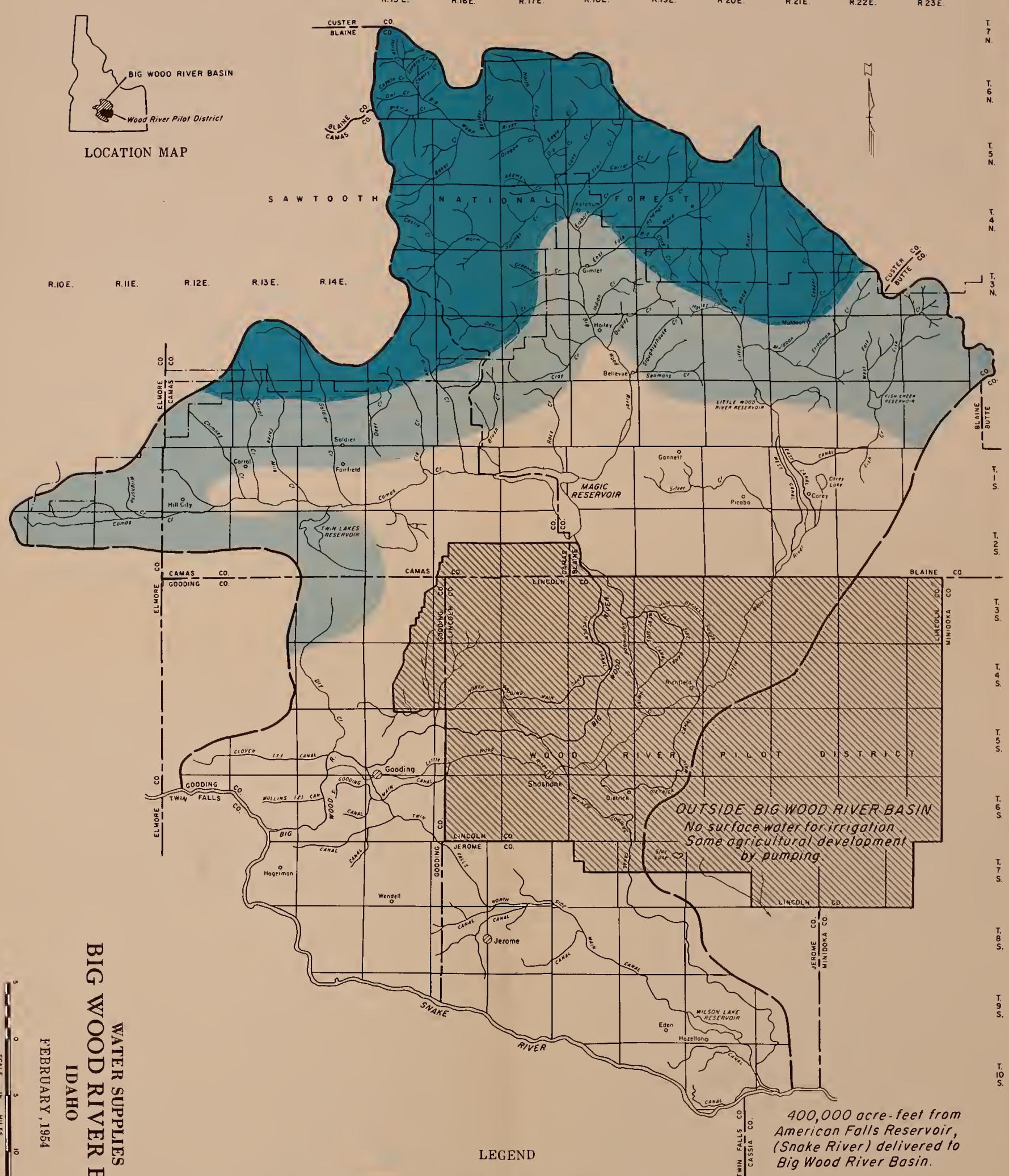
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**WATER SUPPLIES
BIG WOOD RIVER BASIN
IDAHO**

FEBRUARY, 1954

LEGEND

-  Major Water Yielding Area
20 to 30 Inches Annual Precipitation
 -  Minor Water Yielding Area
15 to 20 Inches Annual Precipitation
 -  Less than 15" Annual Precipitation

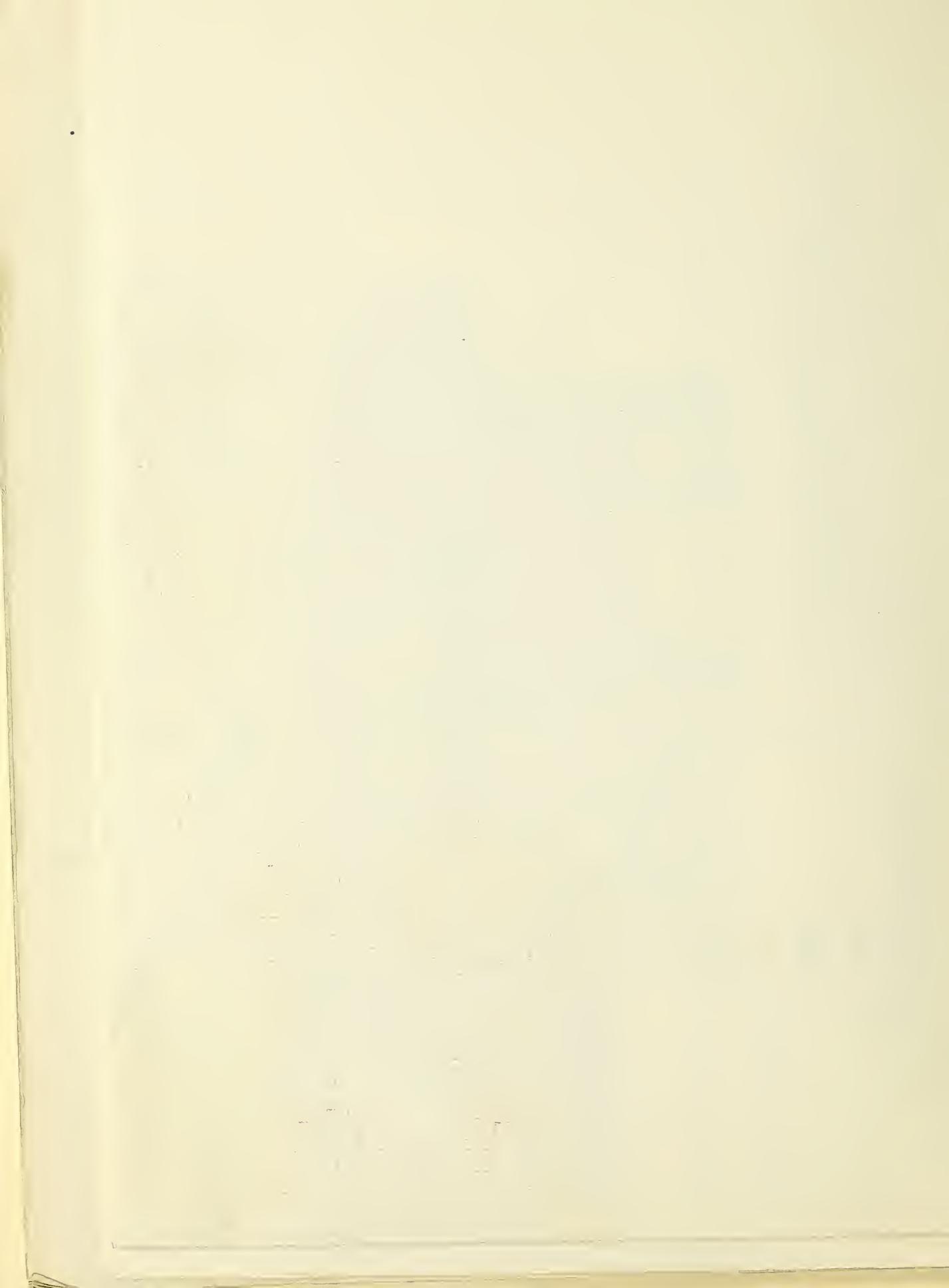


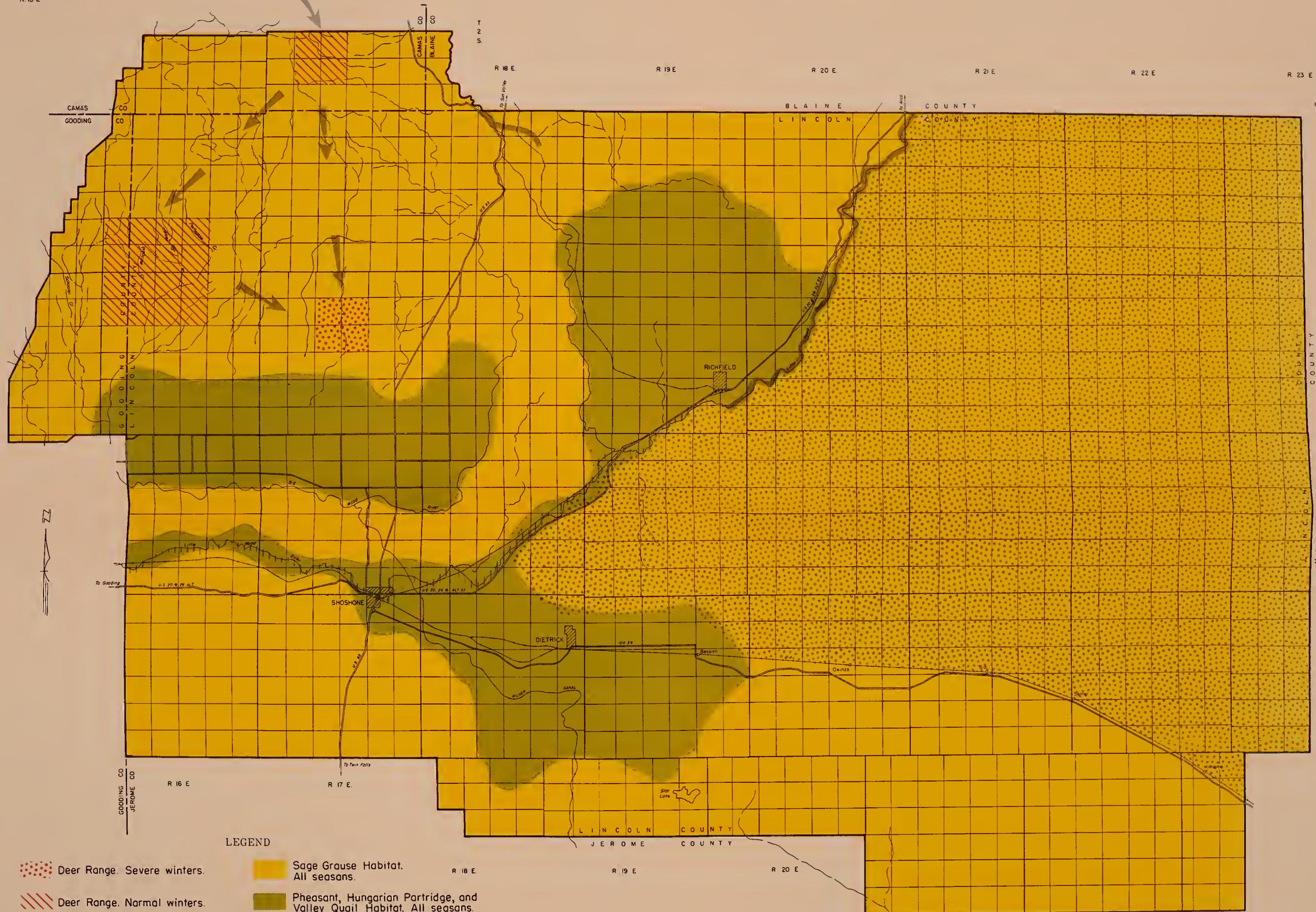
STOCK MOVEMENT BIG WOOD RIVER BASIN IDAHO

FEBRUARY, 1954

LEGEND

- Sheep Movement
- Cattle Movement

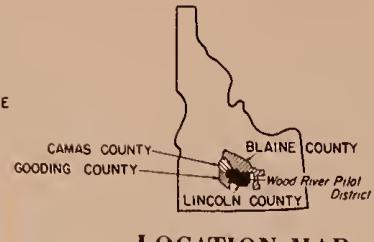




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SCALE IN MILES

GAME MANAGEMENT WOOD RIVER PILOT DISTRICT LINCOLN, BLAINE, CAMAS, & GOODING COUNTIES, IDAHO

JANUARY 1954



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